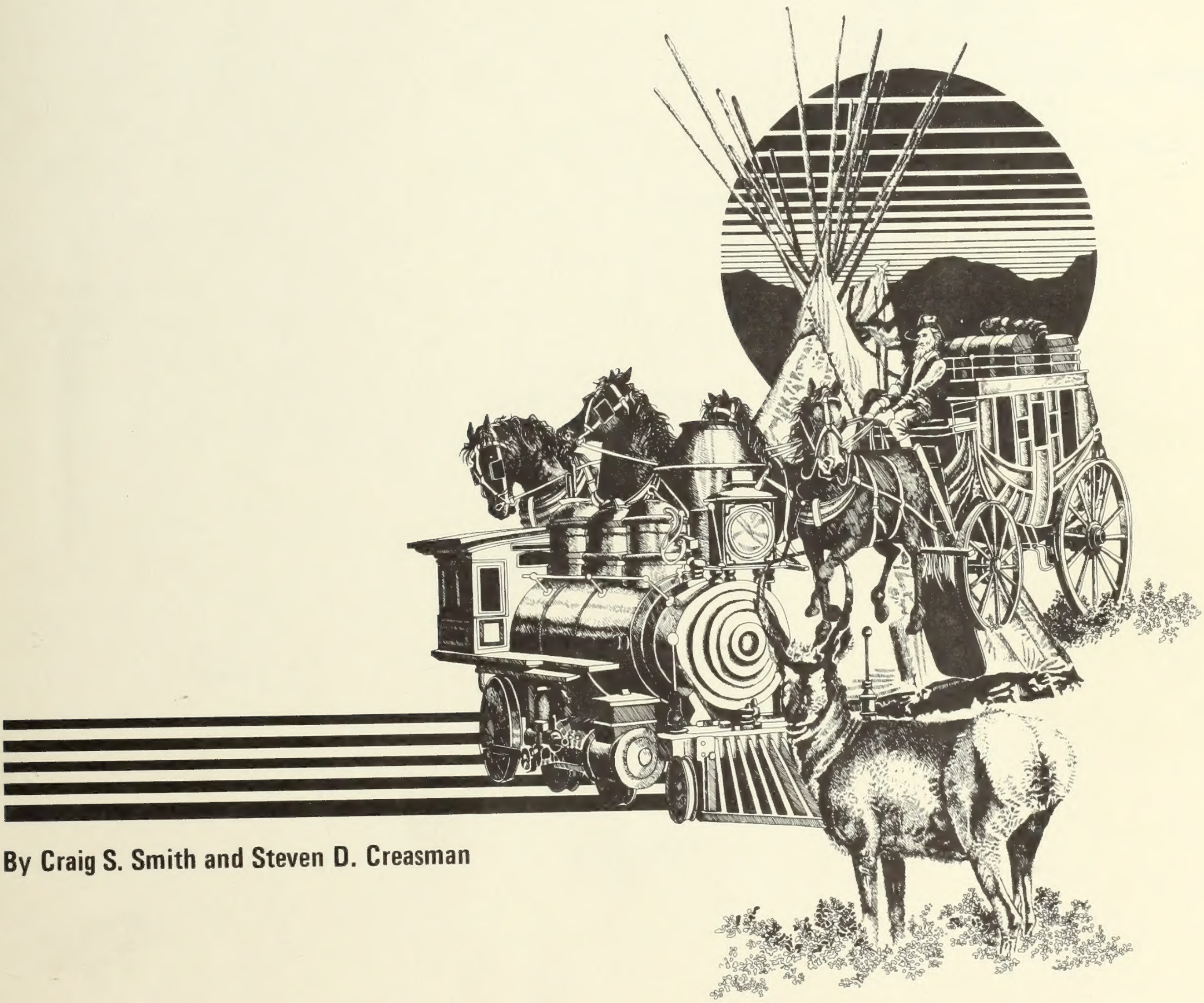
The Taliaferro Site

5000 Years of Prehistory in Southwest Wyoming



By Craig S. Smith and Steven D. Creasman

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Wyoming

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THE TALIAFERRO SITE
5000 Years of Prehistory in Southwest Wyoming

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FOREWORD

The Taliaferro Site is one of three archaeological sites excavated by Archaeological Services of Western Wyoming College in response to the Exxon Company, USA, LaBarge Natural Gas Project. Data recovery was designed to mitigate adverse effects from pipeline construction and associated projects, as required by Federal cultural resource regulations. A total of 300 m^2 was excavated, yielding the remains of eight components dating between 5,290 and 960 years ago. Through analysis of features and other cultural remains, the site provides data about the types of past activities conducted at a residential camp in the Green River Basin. It is to the credit of the authors that they have successfully integrated various analyses to form a picture of diverse activities that took place at the prehistoric Taliaferro Site.

The Taliaferro Report exemplifies what cooperation, coordination, and hard work among many people can achieve. Exxon Company, USA, provided the archaeologists with the opportunity to accomplish more than simple legal compliance; they supported the production of a significant contribution to Wyoming's prehistoric data base. The landowner, Bill Taliaferro, not only gave us permission to excavate the site, but proved to be a strong supporter of cultural resource preservation efforts. Whenever Federal and State officials, private industry, dedicated archaeologists, and supportive private citizens can commit to an effort such as this, quality work will result.

It is with pleasure that we present this volume, the sixth in the Bureau of Land Management's ongoing cultural resource publication series. We hope the information gleaned from the investigation will prove useful to those with an academic as well as avocational interest in Wyoming's prehistory.

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ACKNOWLEDGMENTS

The excavations at the Taliaferro site were the result of the Exxon Company, USA, LaBarge Natural Gas Project. I thank them for the funding, full cooperation, patience, and interest in the excavations. The Bureau of Land Management was the supervising agency, and Dave Vlcek, BLM Kemmerer Resource Area Archaeologist, monitored the progress of the project. Steven D. Creasman, Director of Archaeological Services, was the Principal Investigator. I am grateful to Bill Taliaferro, in whose honor the site was named, for allowing the excavations to be conducted on his land.

The timely completion of the project was possible through the efforts and hard work of the field crew. The field crew consisted of Michael Bergstrom, Merry Lynn Brabant, Katherine Brown, Jesslyn Brown, Steven Daron, Hugh Davidson, Tilman Freitag, Melissa Hickman, Daniel Jepson, Edward Johnson, Kurt Kuhlman, Patricia Mansfield, Chris and Diana Marksz, Leanne McClain, Douglas McKay, Suzanna Montague, Lynelle Peterson, Robert Pigg, Ronald Savage, Jamie Schoen, Gary Shaw, Robert Stevenson, and Bill Wyatt.

Various lab and cataloging tasks were performed by Patrick Bower, Timothy Burchett, Marilyn Christiansen, William Current, Mary Alice Hatfield, Karl Kleinbach, Denise Lant, Robert Pigg, and Annie VanKrieken. Timothy Burchett, Marilyn Christiansen, and Lynn Harrell drafted the figures for the report. William Current photographed the artifacts and printed the photographs for the report. Linda Coker illustrated the flaked stone artifacts, and Cheryl Harrison drew the groundstone implements. The report was edited by Verla Flores. I thank Carole L. Howard-Carter for patiently typing the report.

Craig Smith

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CHAPTER 1

INTRODUCTION

This report details the results of archaeological excavations at the Taliaferro site (48LN1468), a large multicomponent residential camp located in the Green River Basin. The excavations were conducted by Archaeological Services of Western Wyoming College for the Exxon Company, USA, LaBarge Natural Gas Project. A total of 300 m² was excavated at the site; this yielded the remains of eight components. These components, separated horizontally and partially vertically, date between 5290 and 960 years ago. As e idenced by the thousands of charred seeds recovered from the fill of many features, the camp was used primarily during the late summer and fall as a base for the gathering and processing of seeds for the winter. The recovery of huge quantities of debitage, projectile points, and other tools indicates that the production of chipped stone tools was another important activity at this site.

SITE LOCATION AND DESCRIPTION

The Taliaferro site is located just southwest of Fontenelle Reservoir about 40 km east of Kemmerer in Lincoln County, Wyoming (Figure 1). It is on the Shute Creek Lake, Wyoming, 7.5 minute series U.S.G.S. quadrangle map, 1969, and is in Sections 16 and 17, T23N, R112W. The site is situated on private land owned by Bill Taliaferro, for whom the site is named. The surface manifestation of the site includes flaked stone tools, debitage, groundstone, and fire-cracked rock scattered along a ridge for 900 m on the south side of Slate Creek. Material is present also in the floodplain and around a playa in an ephemeral tributary. The buried cultural deposits excavated during this project are on top and on the flanks of a ridge in Section 17.

PROJECT BACKGROUND

In June 1984, Archaeological Services of Western Wyoming College (AS-WWC) contracted with Exxon Company, USA to perform archaeological investigations for the LaBarge Natural Gas Project. Development activities associated with this project included well field extraction and support facilities, the natural gas trunkline, the gasification treatment plant site and railroad spur, and auxiliary pipelines and facilities. The Taliaferro site was one of three sites investigated by AS-WWC along the Feed Gas Pipeline.

The Feed Gas Pipeline portion of the project involved the construction of a 36 inch pipeline from the LaBarge well field in Sublette County to the treatment plant in the Shute Creek Basin, Lincoln County. Activities, limited to a 200 ft right-of-way corridor, consisted of blading to remove vegetation and topsoil, trenching for the pipe, and subsequent refilling, recontouring, and revegetating. Additionally, to facilitate the crossing of Slate Creek with the pipe, a large staging area was bladed on the ridge containing the Taliaferro site.

The data recovery program was initiated in accordance with the Memorandum of Agreement between the Wyoming Bureau of Land Management (BLM), Bridger-Teton National Forest (BTNF), Wyoming State Historic Preservation Office (SHPO), and the Advisory Council on Historic Preservation (ACHP). As stipulated, a project treatment plan was developed and implemented (Creasman et al. 1985). Administration of the project conformed to the various federal

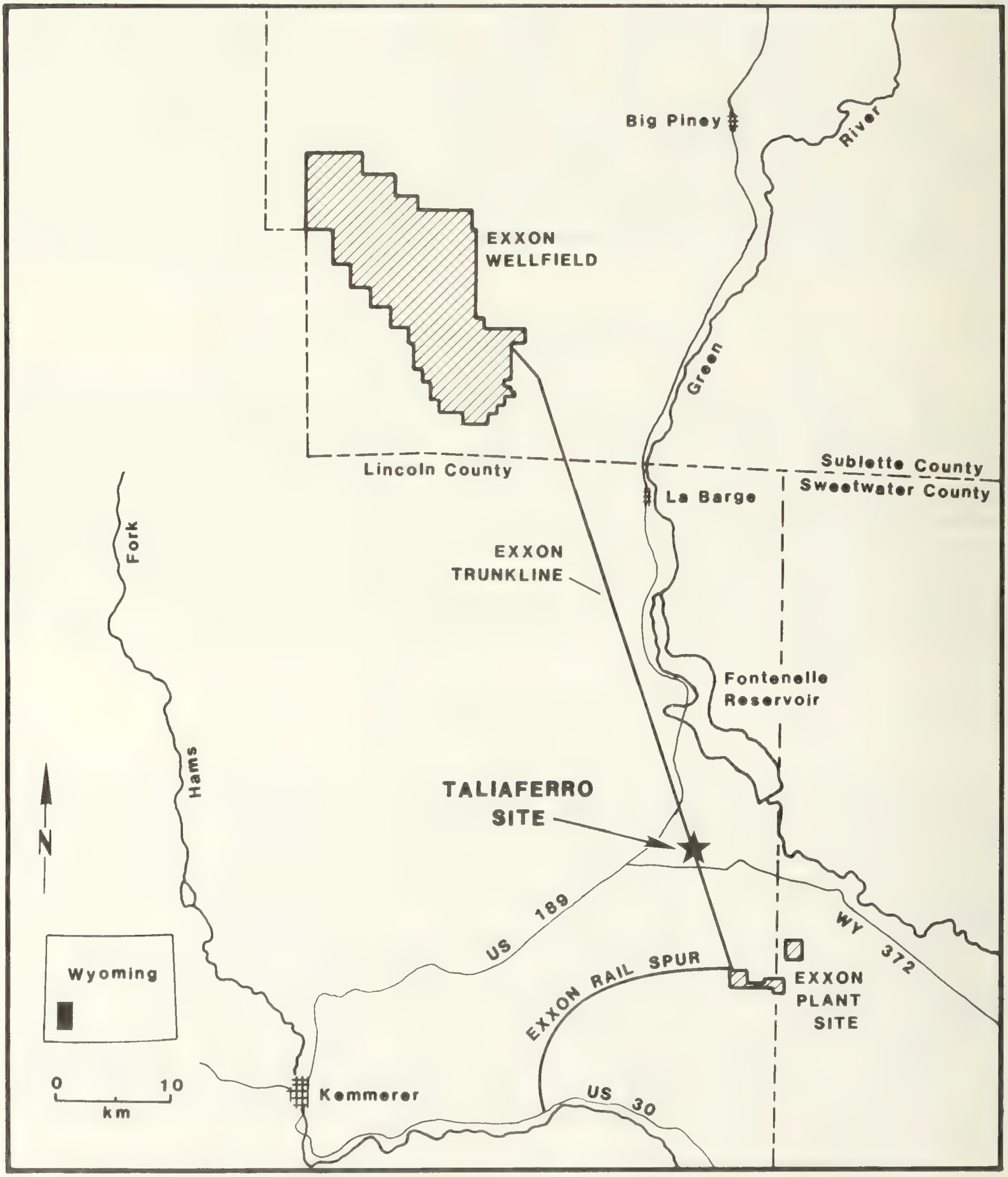


Figure 1. Map of southwest Wyoming showing the location of the Taliaferro site and the Exxon LaBarge National Gas Project.

laws and regulations as outlined in the project treatment plan. The excavations at this site were conducted under Cultural Resource Use Permit No. 038-WY-AR84 issued to Archeological Services of Western Wyoming College on March 19, 1985. Steven D. Creasman was the Principal Investigator, and Craig S. Smith served as site supervisor. Dave Vlcek, BLM Kemmerer Resource Area Archeologist, monitored the progress of the project. The AS-WWC in-house project reference number for the excavations is 85-WWC-06b.

Excavations began March 25 and continued through June 5, 1985, with a field crew averaging 20 individuals. Prior to the excavations, a proton magnetometer survey was conducted so predictions from this work could be tested during the excavations. On June 25 and July 1 and 2, 1985, the blading and trenching across the site was monitored.

The site was originally recorded during inventory of the Feed Gas Pipeline in August 1984 by AS-WWC (Hoefer et al. 1985). To determine if intact, subsurface cultural deposits were present, test excavations were initiated in the fall of 1984. Five backhoe trenches and fifteen 1 x 1 m hand-dug test units were excavated. These revealed buried deposits containing archaeological remains within the right-of-way of the pipeline (Hoefer et al. 1985). These deposits could not be avoided due to constraints imposed by the large site size as well as by the Slate Creek Variant of the Sublette Cutoff (Emigrant Trail), which parallels the south bank of Slate Creek. The archaeological remains were considered significant and eligible for nomination to the National Register of Historic Places because excavations at the site would provide an opportunity to address many of the research questions outlined in the Exxon Company, USA, LaBarge Natural Gas Project Treatment Plan (Creasman et al. 1985).

The data recovery plan called for the excavation of 300 m^2 in two large blocks; the first, referred to as Excavation Area A, is situated on the swale on the southern flank of the ridge, and the second, Excavation Area B, is located on the ridge top overlooking Slate Creek (Hoefer 1985). Additionally, the plan proposed a proton magnetometer survey of a 20 x 20 m block over Excavation Area A to determine if the magnetometer could detect buried cultural features, fire-cracked rock, or trash middens. This program of investigations at the Taliaferro site was designed to mitigate the adverse effects resulting from construction of the pipeline and associated staging area.

RESEARCH ORIENTATION

As described in the treatment plan, the research objectives for the project are divided into two phases (Creasman et al. 1985). The first phase (Phase I) deals with the delineation of the archaeological manifestations of prehistoric activity areas. This phase was designed to guide the excavations at each specific site and will be the focus of this report. The second phase (Phase II) will be implemented following the completation of the individual site excavation reports and will incorporate the Phase I information as well as data from other archaeological investigations in southwest Wyoming. Research for Phase II will refine and test several regional models or topics. These include the development of a regional cultural chronology and history, the refinement of a generalized model of the prehistoric seasonal round, and the examination of the correlation between paleoenvironmental change and shifts in the lifeways of prehistoric peoples of the area.

Activity Area Analysis

The major objective for Phase I investigations is to examine archaeological manifestations of the various prehistoric activities occurring in southwest Wyoming (Creasman et al. 1985:p.2.7-2.13). Understanding the kind, the time of year, and the location of prehistoric activities will provide background for developing regional settlement and subsistence models. Excavations for the LaBarge Project were directed toward testing the validity of three archaeological activity area types--plant processing, animal processing, and residential--that are proposed in the research design. Based on the ethnoarchaeological studies of Binford (1980, 1983) and previous work in southwest Wyoming, a specific set of archaeological attributes are used to define each of these types. The information resulting from the excavations at the Taliaferro site will help refine and revise these hypothesized activity area types.

According to the research design, among the archaeological remains that are expected at a locus of intensive food plant processing are a minimum of one hearth, the presence of groundstone, macrofossil or microfossil remains of edible plants, and a small quantity and low diversity of animal bones. Animal processing areas are represented in the archaeological record by a minimum of one hearth, the presence of anvils, hammerstones, fleshing tools, and cleaver/choppers, and animal bones of more than one individual. Residential areas of a family or multifamily unit engaged in a variety of activities have attributes that include a minimum of one hearth, remains of plant and animal processing, and a high diversity of tool types. A more complete list of the hypothesized attributes of the three activity area types is detailed in the project treatment plan (Creasman et al. 1985:p.2.9-2.11) and in Chapter 5 of this report.

Additional evidence for the patterning of prehistoric activities comes from the spatial relationship of features, fire-cracked rock, flaked stone tools, debitage, groundstone, animal bones, and plant remains. Understanding the distribution of archaeological debris around a central feature, such as a firepit, will provide clues on how prehistoric people used space. This will give some indication of the amount of area required by these people to perform certain activities and shed light on the function of a site.

Regional Research Topics

The Phase II research will concentrate on three regional topics. One topic concerns developing and revising the cultural historical scheme for southwest Wyoming as proposed by Zier et al. (1983). This chronology is the first designed specifically to account for localized developments in the prehistory of the area; however, it is based primarily on the frequency distribution of radiocarbon dates and lacks detail on changes in the archaeological record for the various phases.

Another research topic focuses on refining the generalized model of prehistoric settlement and subsistence for the Rocky Mountain area. This model, as discussed by Sanders et al. (1982), proposes a seasonal round where distinct geographic areas are used during different periods of the year. According to the model, the prehistoric people exploited the resources in the mountains in the summer, used the foothills during the fall and spring, and spent the winter in the lower basins.

The third research objective deals with the correlation of paleoenvironmental fluctuations with changes in the lifeways of the prehistoric people of the area. This problem involves reconstructing the past environments, delineating shifts in the subsistence adaptation of the prehistoric populations, and examining correluations between the two.

CHAPTER 2

BACKGROUND INFORMATION

ENVIRONMENTAL SETTING

To provide background for interpretations resulting from the excavations of the Taliaferro site, the physiography and geology, climate, vegetation, and animals of the Green River Basin are discussed. This summary will emphasize human adapation to the area and focus on the resources available to prehistoric populations. The Green River Basin contains inexhaustible quantites of material suitable for producing flaked stone tools; a wide variety of edible plants and animals; and in localized areas, water.

Physiography and Geology

The Taliaferro site is located in the Green River Basin of the Middle Rocky Mountains physiographic province (Fenneman 1931). One of several intermontane basins known collectively as the Wyoming Basin, the Green River Basin is an elevated plain or plateau with elevations ranging from 1800 to 2100 m (Blackstone 1971). It encompasses the area drained by the Green River, its primary drainage, and is bounded by the Uinta Mountains on the south and the Bear River Divide and Wyoming Range on the west. The Wind River and Gros Ventere ranges form the northern boundary, and the Rock Springs Uplift on the east separates it from other portions of the Wyoming Basin. Bedrock in the Green River Basin is primarily Eocene lacustrine and alluvial deposits of the Green River and Bridger formations which have eroded into badland escarpments, mesas, and buttes (Bradley 1964).

The Taliaferro site is situated along the south side of Slate Creek about 7 km west of the Green River at an elevation of 1989 m (Figure 2). Slate Creek is a perennial, eastward flowing tributary of the Green River that heads in the vicinity of Oyster Ridge and Slate Creek Ridge about 25 km west of the site. In the area of the site, Slate Creek flows through "rather barren" country characterized by a series of flat-topped ridges and buttes of the dark gray and blackish Bridger Formation (Peale 1879:532). To the south these ridges separate the Slate Creek drainage system from the Shute Creek Basin, a dry, ephemeral drainage basin consisting of eolian deposits and reposited materials from the Bridger Formation. A more elevated and dissected plateau of the Green River Formation occurs in the vicinity of Fontenelle Creek north of Slate Creek.

The site is positioned in an area where a low, cobble-covered ridge separates Slate Creek and an ephemeral tributary to the south (Figure 3). South of this ridge, a small playa containing a barrier of sand dunes along its leeward side occurs in the floodplain of the ephemeral tributary. Flaked stone tools, debitage, and fire-cracked rocks are present along the ridge as well as on the floodplain surrounding the playa. The majority of the buried cultural deposits are situated atop and on the flanks of the ridge. Natural deposition consists primarily of eolian materials that developed as a sand shadow on the leeward side of the ridge. Excavation Area A was positioned on the south side of the ridge at the head of a small wash that leads down to the playa (Figure 4). Excavation Area B was placed on the ridge top, just north and slightly downslope of the crest, overlooking Slate Creek (Figure 5).

In an otherwise arid environment, Slate Creek is a ready source of water and was probably a determining factor for the location of the residential camp. Additionally, the creek would have provided a watered corridor between the Green River and the uplands to the west. This drainage, the Slate Creek Cutoff, was a popular route with the emigrants of the 1850s on their way to Oregon and became known as the Slate Creek Trail.

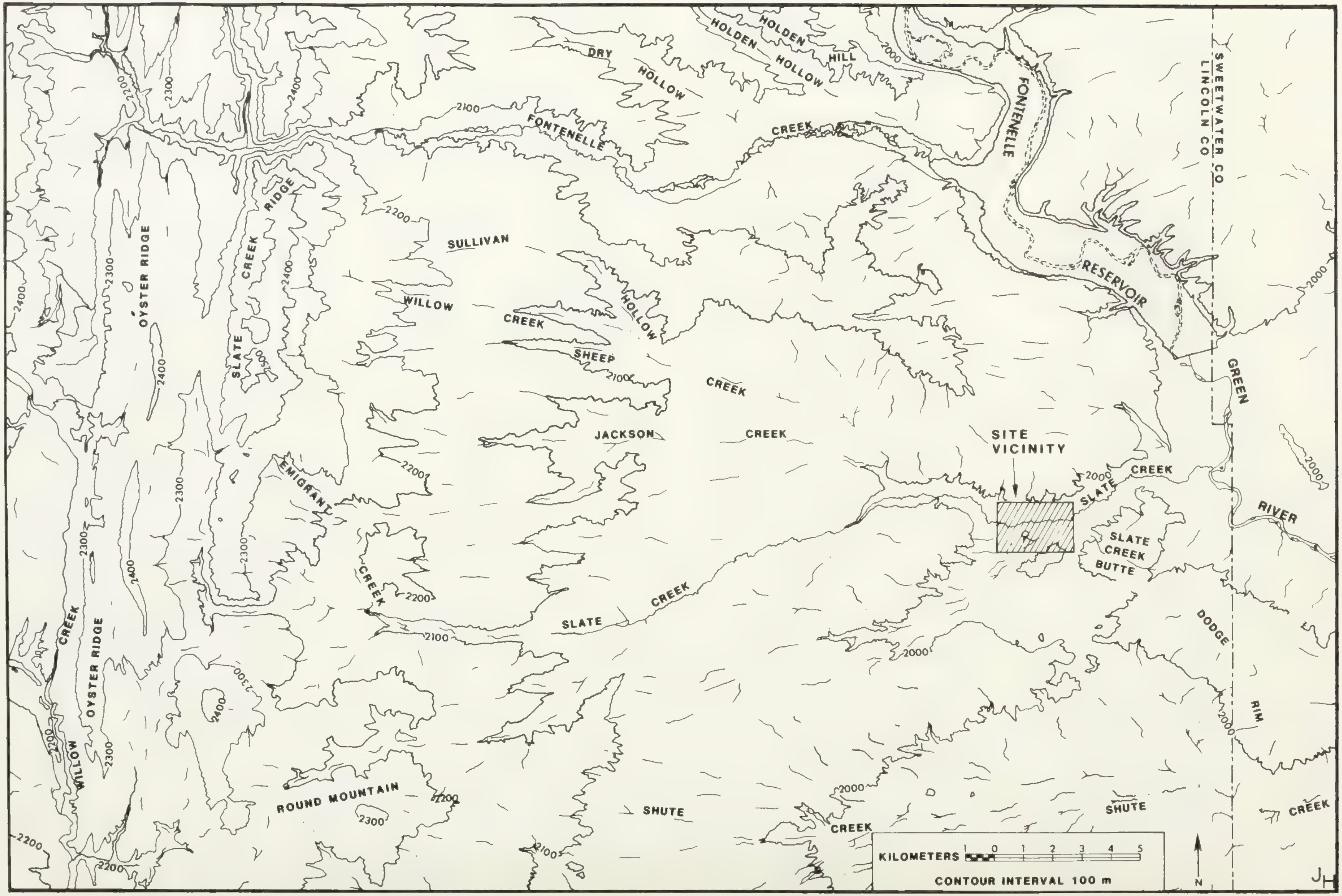


Figure 2. Map of the Slate Creek drainage area showing the location of the Taliaferro site in relation to Oyster and Slate Creek ridges and the Green River. The site vicinity is indicated by the hatched box.

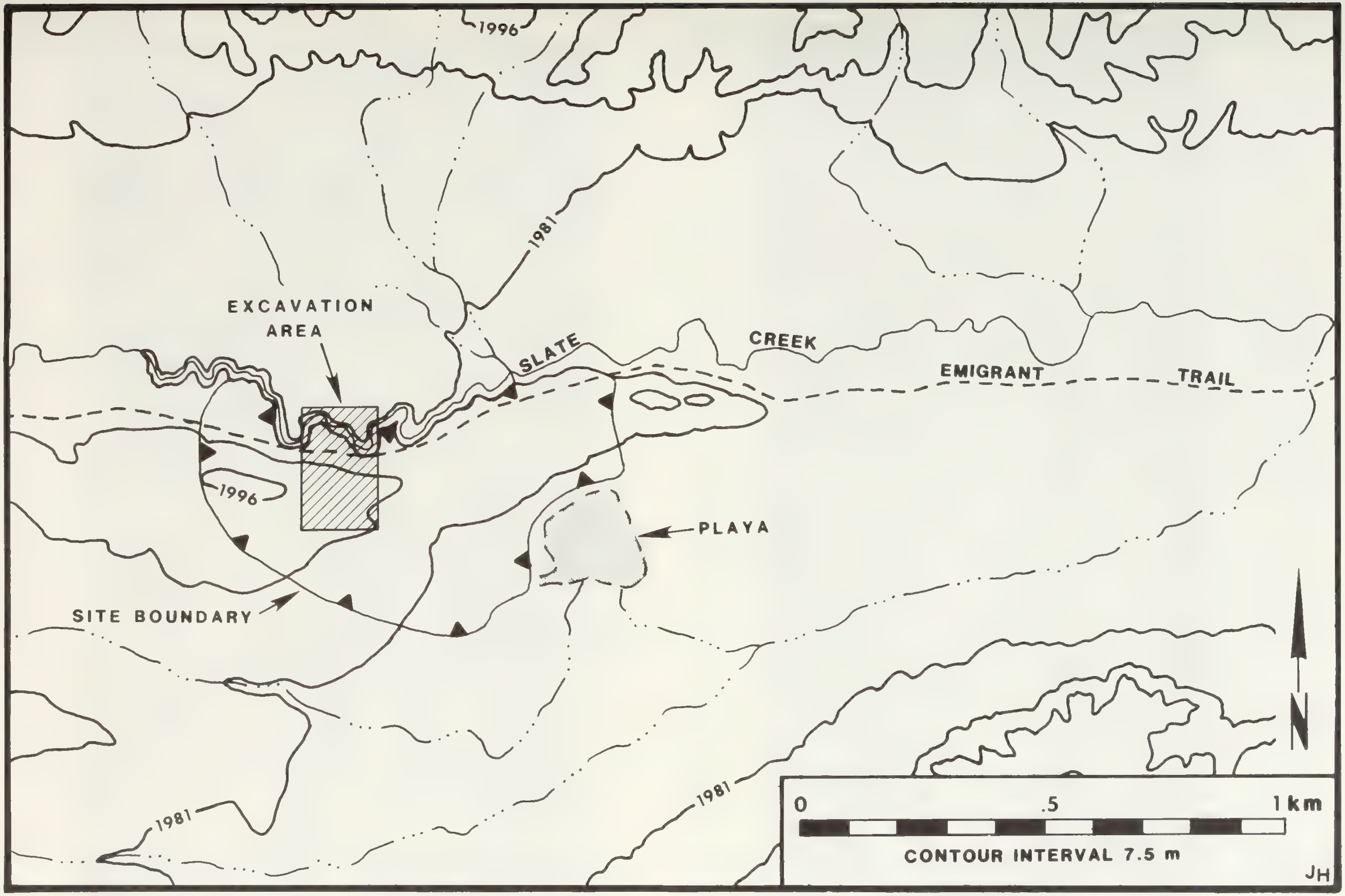


Figure 3. Map of site vicinity showing location of the Taliaferro site on ridge between Slate Creek and an ephemeral tributary.

Figure 4. Excavation Area A with playa and surrounding greasewood-covered floodplain in background.

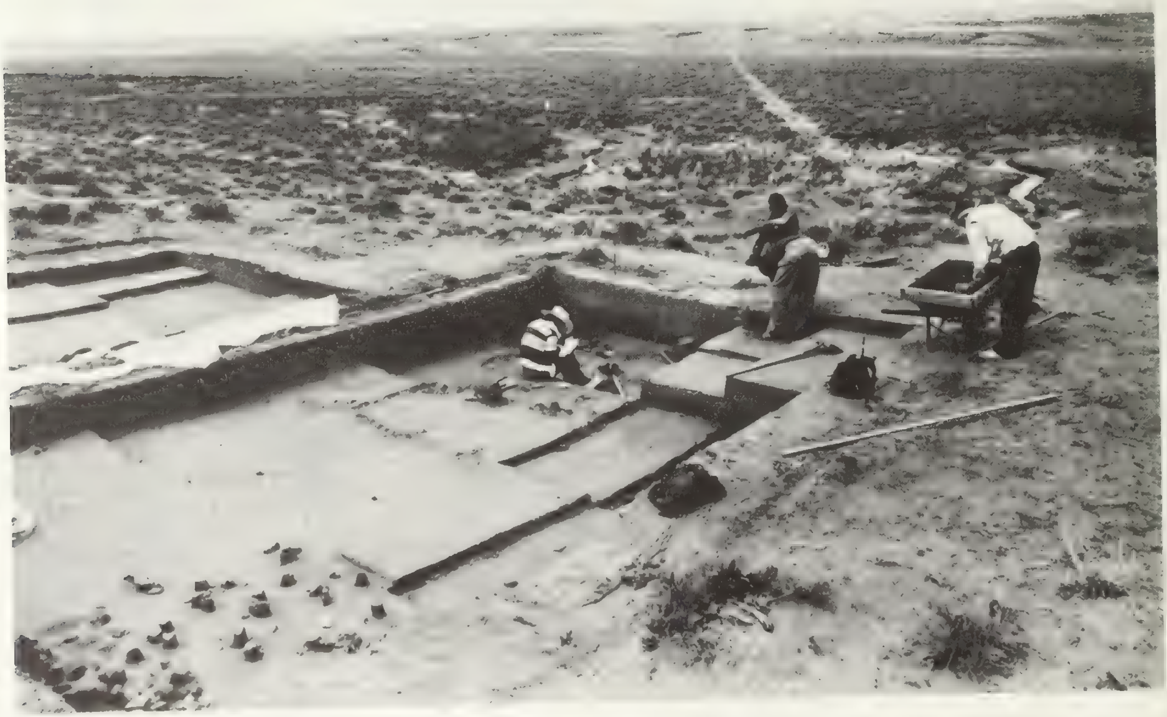


Figure 5. Excavation Area B on ridge overlooking Slate Creek.

Another resource available to the occupants of the site was the quartzite and chert cobbles common on the ridge. Most of the debitage and flaked stone tools recovered during the excavations were of these materials. Other distinctive cherts, including what is called Church Butte Green and Whiskey Buttes, are found in outcrops in the nearby area. Obsidian, present in small amounts in the collection, occurs as pebbles with other cobbles on terraces near the Green River (Love 1977).

Climate

The Green River Basin has climate that can be characterized as being relatively cool and arid to semiarid. The winters are long and cold with temperatures in January, the coldest month, averaging -9° C. However, mean temperatures often drop to -20° C. Most winters are characterized by rapid and frequent changes between mild and cold spells. July is the warmest month in the short and mild summers when mean temperatures reach about 18° C. The period of maximum precipitation occurs in the spring and early summer, and the annual averages are from 20 to 30 cm. Because of early fall and late spring freezes, growing seasons are usually short. At Farson, in the Green River Basin, there is an average of only 42 days between these freezes. At higher altitudes it is even shorter; however, the average growing season can exceed 100 days. Winds predominately from the west blow almost constantly; and during frequent periods in the winter, they reach 50 to 60 km per hour with gusts to 80 or 90. High winds and low tempertures mixed with snow often create blizzard conditions (U.S. Department of Commerce, National Oceanic and Atmospheric Adminstration 1973, 1978).

Vegetation

The Green River Basin and the surrounding mountains contain all of the five life zones described for Wyoming including the Upper Sonoran, Transition, Canadian, Hudsonian, and Arctic-Alpine (Cary 1917). The Upper Sonoran zone, occurring along the rocky areas above the Green River and its tributaries, is characterized by mixed desert shrub vegetation. The species are similar to those of the pinyon-juniper belt of the Great Basin, but with less variety. Pinyon is scattered only on a few ridges in the southern portion of the Green River basin. In addition to the Upper Sonoran Zone, the Transition Zone is prevalent in the Green River Basin. This zone is dominated by sagebrush. An occassional juniper or pine grows on the higher ridges in the foothills. In the mountains surrounding the basin, the Canadian Zone is present. This zone is composed of lodgepole pine and aspen in the lower half and Engelmann spruce in the higher areas. Fringing the Canadian forest belt in the high mountains is a narrow Hudsonian strip of dwarfed forest. Above timberline, this gives way to the Arctic-Alpine zone, especially in the highest peaks of the Wind River Range.

This wide cross section of life zones would have provided the prehistoric inhabitants of the area access to a large variety of useful plants. Among the many food plants available in the mountains, the fruits from serviceberry (*Amelanchier alnifolia*), chokecherry (*Prunus virginiana*), and currents (*Ribes* spp.) were quite important to the ethnographic groups of the region (Chamberlin 1911:343-344; Lowie 1924:201-202). Roots from such highly prized plants as yampa (*Perideridia gairdneri*), checker lily (*Fritillaria atropurpurea*) and spring beauty (*Claytonia megarhiza*) also were collected in the mountains at various times of the year (Chamberlin 1911:339). In the lower zones of the Green River Basin, taxa including goosefoot (Chenopodium spp.) and saltbush (Atriplex spp.) produced large quantities of nutritious seeds that were gathered and stored for winter use. The leaves and stems of several plants found throughout the region were boiled as greens (Chamberlin 1911:337-338).

The area along Slate Creek is within the Upper Sonoran zone. Four vegetation types occur within the immediate site vicinity. These are delineated on the basis of different topographic situations and include the vegetation on the ridge top, the floodplain of the ephemeral drainage, the playa, and the riparian communities along Slate Creek.

The vegetation on the ridge top, where the buried cultural deposits excavated during this project occur, is dominated by spiny hopsage (Atriplex spinosa), sagebrush (Artemisia tridentata), and spiny horsebrush (Tetradymia spinosa). Other shrubs include shadscale (Atriplex confertifolia), green molly summer cypress (Kochia americana), and Douglas rabbitbrush (Chrysothamnus viscidiflorus). Among the grasses common on the ridge is Indian ricegrass (Oryzopsis hymenoides). Forbs observed during the excavations in the late spring and early summer are timber poisenvetch (Astragalus convallorius), snowball sandverbena (Abronia fragrans), flaxleaf hedge mustard (Schoenocrambe linifolia), pale evening primrose (Oenothera pallida ssp. trichocalyx), silk crazyweed (Oxytropis sericea), and sand penstemon (Penstemon arenicola).

The more open, sandy areas on the ridge top are covered with winterfat (Ceratoides lanata) and Nutall's saltbush (Atriplex gardneri). Greasewood (Sarcobatus vermiculatus) and pricklypear (Opuntia polyacantha) mark the more active areas on the edge of the sand shadow. The vegetation on the alluvial clays of the floodplain below the ridge consists primarily of greasewood, sagebrush, and Nutall's saltbush.

Among the forbs present on the playa in the late summer and early fall are bien wormwood (Artemisia biennis), goosefoot (Chenopodium berlandieri), and thyme-leaf spurge (Chamaesyce serpyllifolia). Surrounding the playa is a narrow band dominated by grasses such as saltgrass (Distichlis spicata) and alkaligrass (Pucinellia nuttalliana). Also common around the playa is Nutall's saltbush.

Along Slate Creek there is a narrow riparian community containing Nebraska sedge (Carix nebraskensis), Baltic rush (Juncus balticus), west mountain aster (Aster occidentalis), field mint (Mentha arvensis), and silverweed cinquefoil (Potentilla anserina). These taxa occur in fairly dense stands along the watercourse. Tall bushes of sagebrush (Artemisia tridentata), some almost 2 m high, and grasses such as basin wildrye (Elymus cinereus) and reedgrass (Calamagrostis neglecta) form a band just outside of the community containing the sedges and rushes.

The Taliaferro site is ideally situated for easy access to four vegetation types which generally occur only in widely scattered patchs in the Green River Basin. Each of these provides different food plants that were important to the ethnographic groups of the area. The playa contains fairly dense stands of Chenopodium, an important source of edible seeds that usually grow in disturbed areas. Large quantities of charred Chenopodium seeds were found in several features at Taliaferro site. This is the most common plant macrofossil in many collections from other sites in the Wyoming Basin (Schroedl 1985:200). The riparian communities along Slate Creek provide food plants that are limited to waterways in the area. Evidence for their use at the site comes from charred sedge (Carix sp.) and mint (Mentha sp.) seeds in some of the features. The vegetation on the ridge top also contains important food plants, such as Indian rice grass, saltbush, and greasewood. Charred seeds from these species are present in the plant macrofossil collection.

Animals

In addition to a wide variety in plant life, a large diversity of animals occurs in the five life zones of southwest Wyoming (Cary 1917). Large mammals common in the Green River Basin include pronghorn (Antilocarpa americanus), mule deer (Odocoileus hemoinus), elk (Cervus elaphus canadensis), and moose (Alces alces). Of these, pronghorn is the most abundant today and was extensively used by the prehistoric people of the area. Several large pronghorn kill sites, such as the Austin Wash site (Schroedl 1985), the Eden-Farson site (Frison 1971), and others (Reiss and Walker 1982), are known from the archeological record. This evidence indicates that antelope were hunted prehistorically in communal drives similar to those recorded in the ethnographic literature (Lowie 1924; Steward 1938). The remains of mule deer, which were probably pursued by individuals, are also present in archeological sites in the area (Harrell and McKern 1986). Bones of both deer and antelope were recovered at the Taliaferro site.

Bison (Bison sp.) and sheep (Ovis sp.) probably roamed the Green River Basin in the past. Most archeological sites in southwest Wyoming, as well as this site, contain at least some bison bone (Armitage et al. 1982; Harrell and Mckern 1986). The Wardell site is a Late Prehistoric bison trap and meat processing area that is located in the upper Green River Basin (Frison 1973). Sheep also were present at one time in the basin (Cary 1917), and their remains occur at the Deadman Wash site (Armitage et al. 1982), Pine Spring site (Sharrock 1966), and Harrower site (Thompson in prep.).

Of the small mammals occurring in the Green River Basin, cottontail (Sylvilagus spp.) and white-tailed jackrabbit (Lepus townsendii) were probably the most important to the ethnographic people. They were hunted communally for their meat and skins. The skins were made into blankets (Lowie 1924:196). Bones of these animals are common in archeological sites in southwest Wyoming (Armitage et al. 1982; Schroedl 1985). Numerous other mammals inhabit the Green River Basin, including the badger (Taxidea taxus), coyote (Canis latrans), long tailed weasel (Mustela frenata), striped skunk (Mephites mephitis), red fox (Vulpes fulvc), bob cat (Lynx ruferus), mountain lion (Felis concolor), and several taxa of rodents (Long 1965). Many of these, especially the rodents, were used extensively by the ethnographic groups of the area (Lowie 1924:199; Steward 1938:33).

Birds, reptiles, and insects are also common in the Green River Basin, and many were exploited as food during ethnohistoric times (Steward 1938:33). Sage grouse (Centrocercus urphaseanus) is a prevalent game bird that was hunted during prehistoric times as evidenced by the recovery of their remains at this site, the Deadman Wash site (Armitage et al. 1982), the Maxon Ranch site (Harrell and Mckern 1986), and 48SW1242 (Hoefer 1986). Other birds, including migratory water fowl, occur in the area and were exploited in the past when available. In years when abundant, grasshoppers and Mormon crickets were taken in large quantities (Steward 1938:34). Evidence of the prehistoric use of insects comes from the Eden-Farson site where charred fragments of Mormon crickets (Anabrus simplex) and large red ants (Pogonomyrmet sp.) were found in several of the Protohistoric Shoshonean lodges (Frison 1971). Fresh water mussels also occur in some of the rivers and creeks of the basin, and their shells have been found at the Wardell site (Frison 1973), the Deadman

Wash site (Armitage et al. 1982), and 48UT779 (Schroedl 1985) as well as the Taliaferro site.

CULTURAL HISTORICAL BACKGROUND

To place the excavations at the Taliaferro site in a historical perspective, a brief summary of archaeological investigations and cultural chronologies are presented. Though archaeological remains have been recorded in the Green River Basin since the last century, only recently has enough information been collected to begin to examine more specifically the lifeways of the prehistoric populations of the area. Usually the cultural history of southwest Wyoming has been incorporated into broad regional schemes, such as those for the Northwestern Plains. This has obscured the more localized developments. Recent attempts at devising a local cultural chronology will be tested using data resulting from excavations ancillary to the Exxon LaBarge Project.

History of Archeological Investigations

Although an understanding of the cultural history and subsistence and settlement patterns of the prehistoric people of the Green River Basin is just now becoming clearer, archaeological remains have been known for over a hundred years. Researchers working with the early government scientific explorations in the 1870s first noted flaked stone tools mixed with the gravels on the ridges in the southern Green River Basin. During reconnaissances for the Hayden surveys in 1872, Leidy (1873:651) noted stone tools at favorable locations for permanent camping sites. Later, Jones (1875:260) described a few cores or crude bifaces discovered while traveling through the basin to Yellowstone National Park. He considered these artifacts as "merely the rejected pieces which have been spoiled during the process of manufacturing more perfect implements." No speculation was made as to their age.

In the 1930s, E. B. Renaud (1936, 1938, 1940) made the first attempt at defining a cultural chronology for the Green River Basin based on work in the vicinity of the Black's Fork River near present-day Granger, Wyoming. This chronology was divided into three occupations referred to as the Typical, Peripheral, and Sand Dune cultures. Renaud considered the Typical and Peripheral cultures as contemporaneous and dating to 30,000 or 40,000 years ago as evidenced by the resemblance of the "artifacts" (actually natural ventifacts, biface performs, and blanks) to those of the Early and Middle Paleolithic of the Old World. The much younger Sand Dune Culture was characterized by the presence of unweathered flaked stone tools, grinding stones, and fire hearths occurring within stabilized dunes.

A more realistic determination of the antiquity of the prehistoric occupation in the Green River Basin came from excavations at the Finley site in the 1940s (Moss et al. 1951). The site is situated in an area of stabilized sand dunes near a spring and bog. Excavations revealed bones of extinct bison associated with Eden and Scottsbluff points of the Cody Complex dating to 9000 years ago.

The Pine Springs site is another excavated site that yielded clues to the cultural chronology of the Green River Basin (Sharrock 1966). The site is located around a mountainside spring and contains at least three occupation layers. The earliest one dates to 9745 years ago and has bone of bison and mountain sheep and unfluted lanceolate projectile points. Bone implements, grinding stones, and firepits first appear in the second occupation layer, which dates to 3685 years ago. The third occupation is characterized by Fremont pottery sherds. Unfortunately, the deposits at the site were shallow, and much of the artifactual material was mixed.

During the 1950s and 1960s, reconnaisance surveys were conducted prior to the construction of the Big Sandy, Flaming Gorge, and Fontenelle reservoirs, which increased our knowledge of the archaeology of the area. Within the Big Sandy Reservoir, 13 sites were located. One was extensively excavated and produced projectile points similar to those of the McKean Complex (Davis 1956:43). A total of 121 prehistoric sites was recorded during surveys in the area around Flaming Gorge Reservoir. These consisted primarily of open sand dune sites (Day and Dibble 1963). Work on the Fontenelle Reservoir, located near the Taliaferro site, resulted in the discovery of 22 archaeological sites mostly associated with stabilized and active dunes (Dibble and Day 1962). Several of these sites were found along the lower reaches of Slate Creek.

George Frison, in the early 1970s, excavated and reported on two sites in the Green River Basin which provided information on the Late Prehistoric and Protohistoric procurement of animals. The Wardell site is a bison trap with an associated meat processing area dating between 1580 and 990 years ago (Frison 1973). Evidence of Shoshonean pronghorn exploitation comes from the Eden-Farson site (Frison 1971). This site contained the remains of at least 12 lodges and faunal material represent over 200 pronghorn.

Over the past decade, numerous development-related archeological projects have added considerably to an understanding of the prehistory of the Wyoming Basin. Stratified sites, such as the Deadman Wash site (Armitage et al. 1982), have yielded long records of human occupation in the area. Excavations for several pipeline projects have shown that southwest Wyoming has been inhabited throughout the Archaic and Late Prehistoric periods (cf. Metcalf and Anderson 1982a, 1982b; Schroedl 1985). Several sites representing limited activities, such as plant or animal processing, have provided clues to settlement and subsistence patterns (Creasman et al. 1983; Reiss and Walker 1982; O'Brien 1982). Other excavations have revealed that pithouses were used in the region as early as 6000 years ago (Harrell and McKern 1986). Evidence of prehistoric subsistence, in addition to animal exploitation, has come from the recovery of charred seeds from the fill of features (Schroedl 1985).

This accumulation of data has allowed researchers to begin to focus on problems specifically related to the adapation of prehistoric peoples in southwest Wyoming. Along with information collected during the archeological investigations for the Exxon LaBarge Project, this body of data will provide a framework for addressing questions pertaining to settlement, subsistence, seasonality, resourse use scheduling, and changes in these through time.

Cultural Chronologies

Due in part to scarcity of data, the sequence of prehistoric occupations in southwest Wyoming has usually been included in cultural chronologies that encompass entire regions, such as the Northwestern Plains. Those developed for the Northwestern Plains consist of Mulloy's (1958), which is based on sequences from a few widely scattered sites, and the revison by Frison (1978) incorporating known sites from Wyoming. Various chronologies from other regions that are pertinent to southwest Wyoming include those for the Northern Colorado Plateau (Leach 1970; Schroedl 1976) and the eastern Great Basin (Heizer and Hester 1978; Jennings 1978). Recently, a scheme based on changes in the frequencies of radiocarbon dates has been devised specifically for southwest Wyoming (Zier et al. 1983).

Because southwest Wyoming has traditionally been included with the Northwestern Plains, the following summary will focus on those chronologies; however, this does not necessarily imply cultural connections with the Plains. Information collected over the past several years has shown many similarites, especially in subsistence orientation and projectile points, with the Great Basin and northern Colorado Plateau (Zier et al. 1983; Wheeler et al. 1986).

The first historical outline of the Northwestern Plains was proposed by William Mulloy (1958). It was constructed using comparisons of sequences from nine widely scattered, stratified sites. These included Pictograph Cave and Billings Bison Trap in Montana; Signal Butte and Ash Hollow Cave in southwestern Nebraska; Promontory Caves I and II, Deadman Cave, and Black Rock Cave located near the Great Salt Lake in Utah; and Birdshead Cave in central Wyoming. Using changes in the morphological characteristics of projectile points from these sites, the cultural scheme was divided into five periods: the Early Prehistoric, Early Middle Prehistoric, Late Middle Prehistoric, and Late Prehistoric (Figure 6).

According to Mulloy (1958), the Early Prehistoric period corresponds to the Paleoindian period and ends about 6000 years ago. None of the stratified cave sites used in developing the chronology contained material of this period. Following 6000 years ago and to about 4500 years ago there was a hiatus in the archeological record known to Mulloy in the 1950s. The Early Middle Prehistoric period, dating to about 3200 years ago, is characterized by side-notched and lanceolate points. Corner-notched points mark the Late Middle Prehistoric period, which dates up to 1500 years ago. The Late Prehistoric period is distinguished by small triangular points, with or without notches, and continues from 1500 years ago to the historic period.

George Frison (1978) revised Mulloy's historical outline for the Northwestern Plains using radiocarbon dates and information from sites excavated since the 1950s. Most of the focus in Frison's analysis was on sites in Wyoming; however, only a few were located in southwest Wyoming, and these represent mostly the Paleoindian and Late Prehistoric periods. Basically, Frison changed the name of the Early Prehistoric period to the Paleoindian period and divided the Middle Prehistoric period into three periods, the Early, Middle, and Late Plains Archaic (Figure 6).

The Paleoindian period encompasses the Clovis, Folsom, Agate Basin, Hell Gap, Alberta, and Cody complexes and dates between 11,200 and 7500 years ago. Marked by an abrupt change in projectile point styles from lanceolate to side-notched types, the Early Plains Archaic includes Mulloy's hiatus. The Middle Plains Archaic dates from about 5000 to 3000 years ago and is characterized by the appearance of the McKean Techno-complex. Point types included in this complex are the Mckean lanceolate, Duncan, Hanna, and Mallory. Following this, the Late Plains Archaic period dates between 3000 and 1500 years ago and is distinguished by corner-notched points, such as the Pelican Lake type common on the Northwestern Plains. The Late Prehistoric begins about 1500 years ago and continues to the Protohistoric. This period is marked by the introduction of the bow and arrow, ceramics, and a dramatic increase in the number of sites.

In the past few years, information from recent excavations in southwest Wyoming has been used to refine Frison's five-part sequence (Schroedl 1985; Zier et al. 1983). Generally these schemes follow the divisions and dating as proposed by Frison (1978). Because of similarities to the Great Basin and northern Colorado Plateau in the archaeological record from southwest Wyoming,

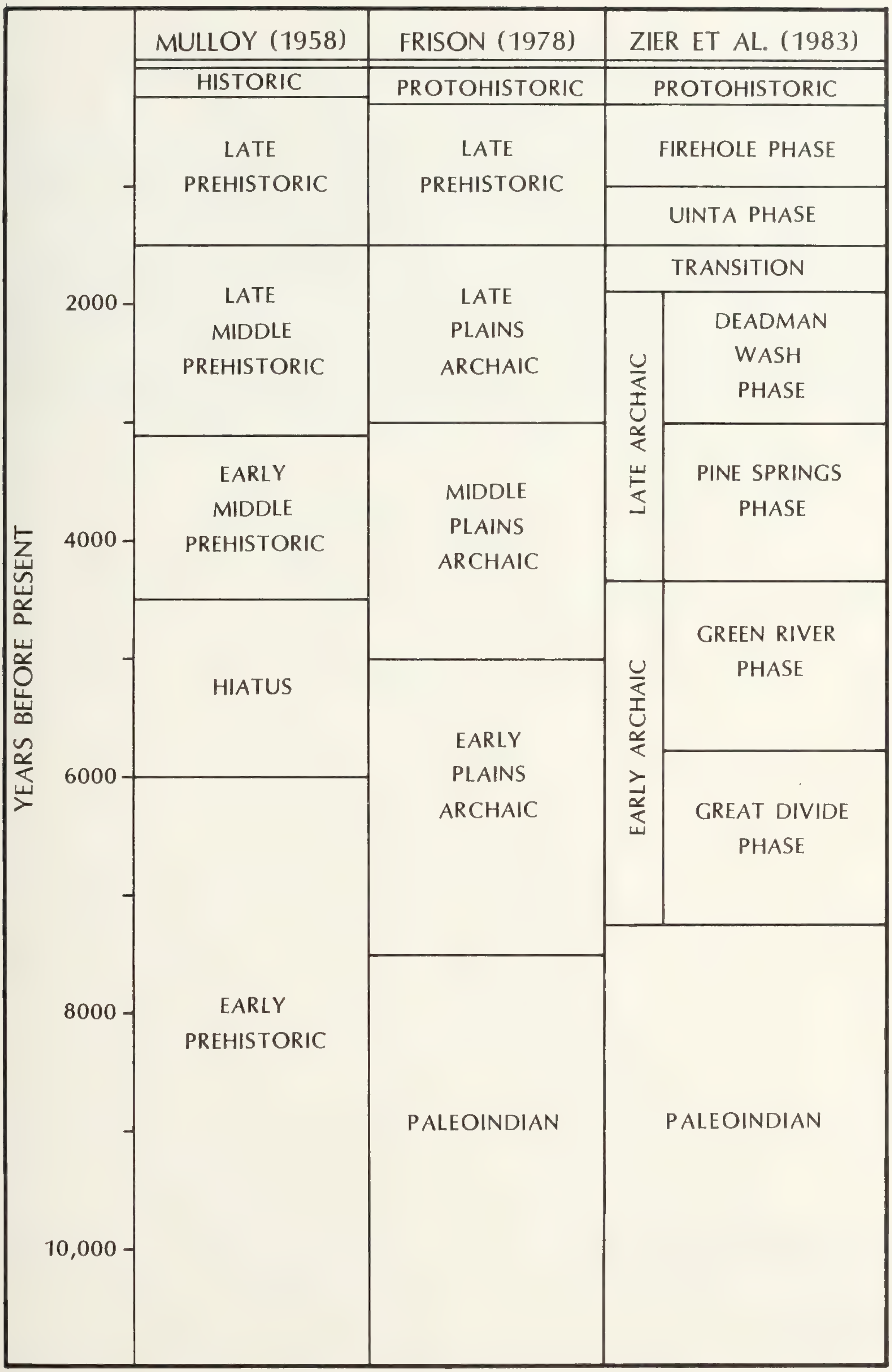


Figure 6. Diagram of the Mulloy (1958) and Frison (1978) cultural historical chronologies for the Northwestern Plains and the Zier et al. (1983) scheme for southwest Wyoming.

the term "Plains" has been dropped from Frison's name for the Archaic periods in these summaries.

Recognizing localized developments in the prehistory of the Wyoming Basin, Zier et al. (1983) have devised a cultural historical scheme focusing specifically on southwest Wyoming. This chronology generally is divided into the Paleoindian, Archaic, and Late Prehistoric periods that conform to Frison's sequence (Figure 6). The Archaic is separated further into the Great Divide, Green River, Pine Spring, and Deadman Wash phases, and the Late Prehistoric is broken into the Uinta and Firehole phases. Unfortunately, the sequence is based primarily on the frequency distribution of radiocarbon dates and lacks detail on changes in artifact types and subsistence and settlement patterns. This lack of detail is in part due to the scarcity of data from excavated sites in southwest Wyoming representing several of the phases. Information collected as a result of archaeological excavations for the Exxon LaBarge Project will provide a means of testing and revising this scheme.

CHAPTER 3

METHODS

FIELD METHODS

A total of 300 m² was excavated at the Taliaferro site in two block areas; one, referred to as Excavation Area A, consisted of 208 m² and the other, Excavation Area B, was 92 m². Excavation Area A was located on the swale on the southern flank of the ridge and Area B was situated on the ridge top overlooking Slate Creek (Figure 7). Prior to excavations, a proton magnetometer survey of a 20 x 20 m area was conducted over Area A in the hope of detecting buried cultural features, fire-cracked rock, or trash middens. Excavations were placed in the area of the magnetometer survey to determine if the magnetic anomalies from the survey corresponded to archaeological remains.

A block excavation strategy was used during this project because it allowed for the complete recovery of debris that resulted from prehistoric activities occuring in particular portions of the site. The exposure of entire areas enables the investigation of the spatial relationships between features, flaked stone tools, groundstone, and debitage. Also, the relative amounts of each type of these remains can be determined. This information provides an opportunity to delineate the various activities carried out by the prehistoric inhabitants of the site (Struever 1973).

To facililate the visualization of the relationships between these remains in the field, the entire block area was exposed simultaneously by cultural layer or component. This was accomplished by first excavating several units down to a definable cultural layer or component. At that point the remainder of the excavation block was taken down to fully expose the component. The fill from each excavation unit was removed in 10 cm levels to help sort cultural material where clear stratigraphic levels could not be deliniated. As cultural material (features and fire-cracked rock primarily) was encountered, the find was pedestalled to maintain both component relationship and arbitary excavation level spacing. As each cultural layer was excavated, fire-cracked rock and features were left in place and, when possible, flaked stone tools and groundstone were recorded in situ (Figure 8). This enabled the drawing of preliminary interpretations as excavation proceeded and provided a means to avoid the mixing of artifacts from different components. Because excavations were conducted in the late winter and spring, tents with heaters were used for part of the season (Figure 9). The general excavation methods, as well as the procedures used to record features and occupation floors, stratigraphy, and ancillary samples in the field, are briefly described below.

General Excavation Procedures

The excavations at the Taliaferro site followed the field methods as outlined in the LaBarge Project treatment plan (Creasman et al. 1985). Horizontal and vertical provenience was recorded in relation to a datum established on the ridge in the center of the site during the 1984 test excavations (Hoefer et al. 1985). Horizontal control was maintained by using a grid reference system orientated to magnetic north with datum as the 0/0 meter point. Vertical measurements were related to datum, which was arbitrarily set at an elevation of 100 m.

The basic excavation square was a 2 x 2 m unit divided into 1 x 1 m quadrants. The 2 x 2 m units were named using the number of meters east or west and north or south that the northeast corner was from datum. Figures 10 and 11 show the location and numbering of the units within Excavation Areas A and B. The 1 x 1 m squares were recorded as either the northwest, northeast,

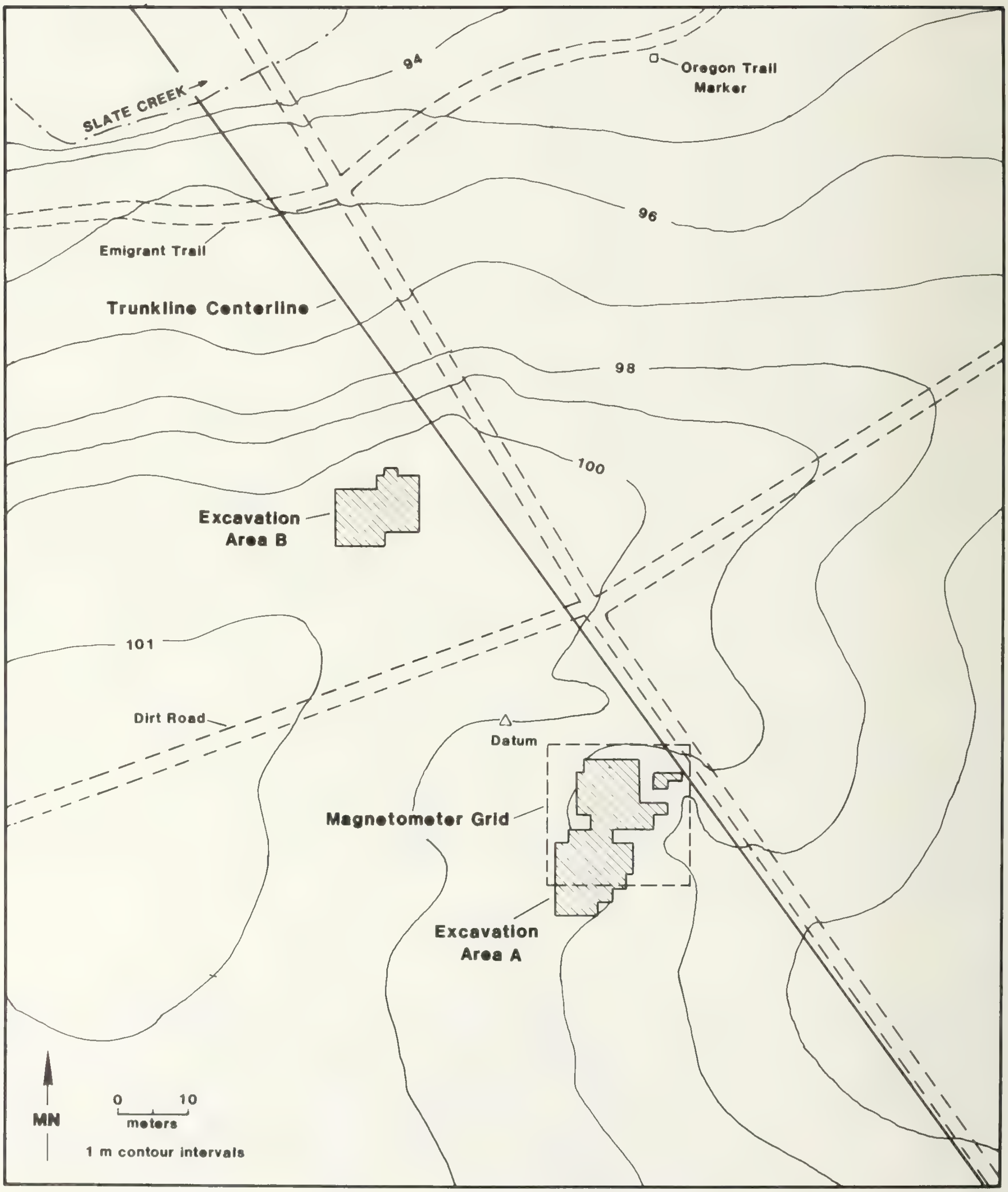


Figure 7. Contour map of site excavation area showing Area A and Area B in relation to the Exxon LaBarge natural gas pipeline.

Figure 8. South half of Excavation Area A showing excavation in progress with fire-cracked rock and features for Component VI left in place.

Figure 9. North half of Excavation Area A showing excavation in progress under tent with heaters. The central portion is being excavated down to the level of the next component.

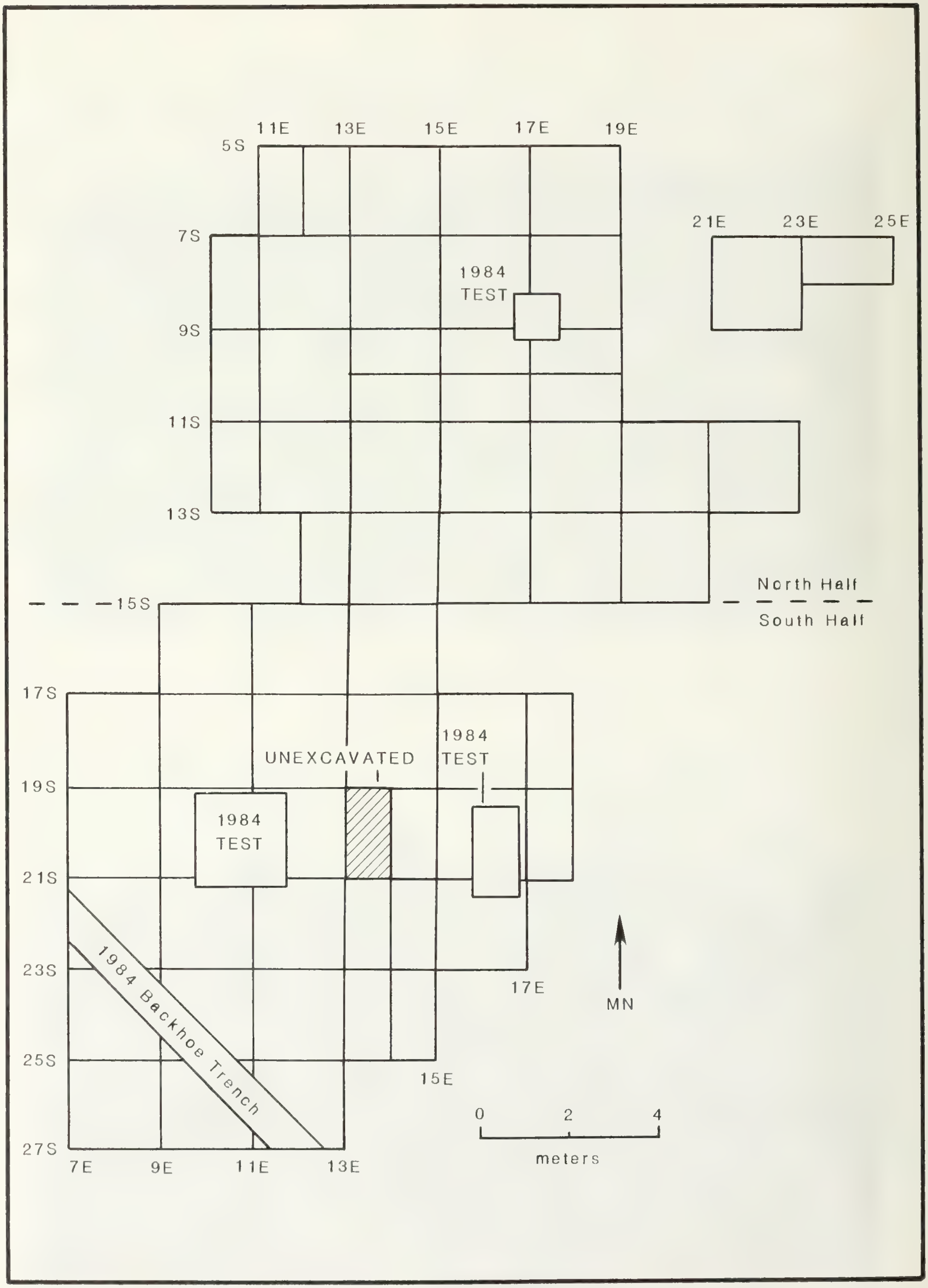


Figure 10. Plan map of Excavation Area A showing location and numbering of units.

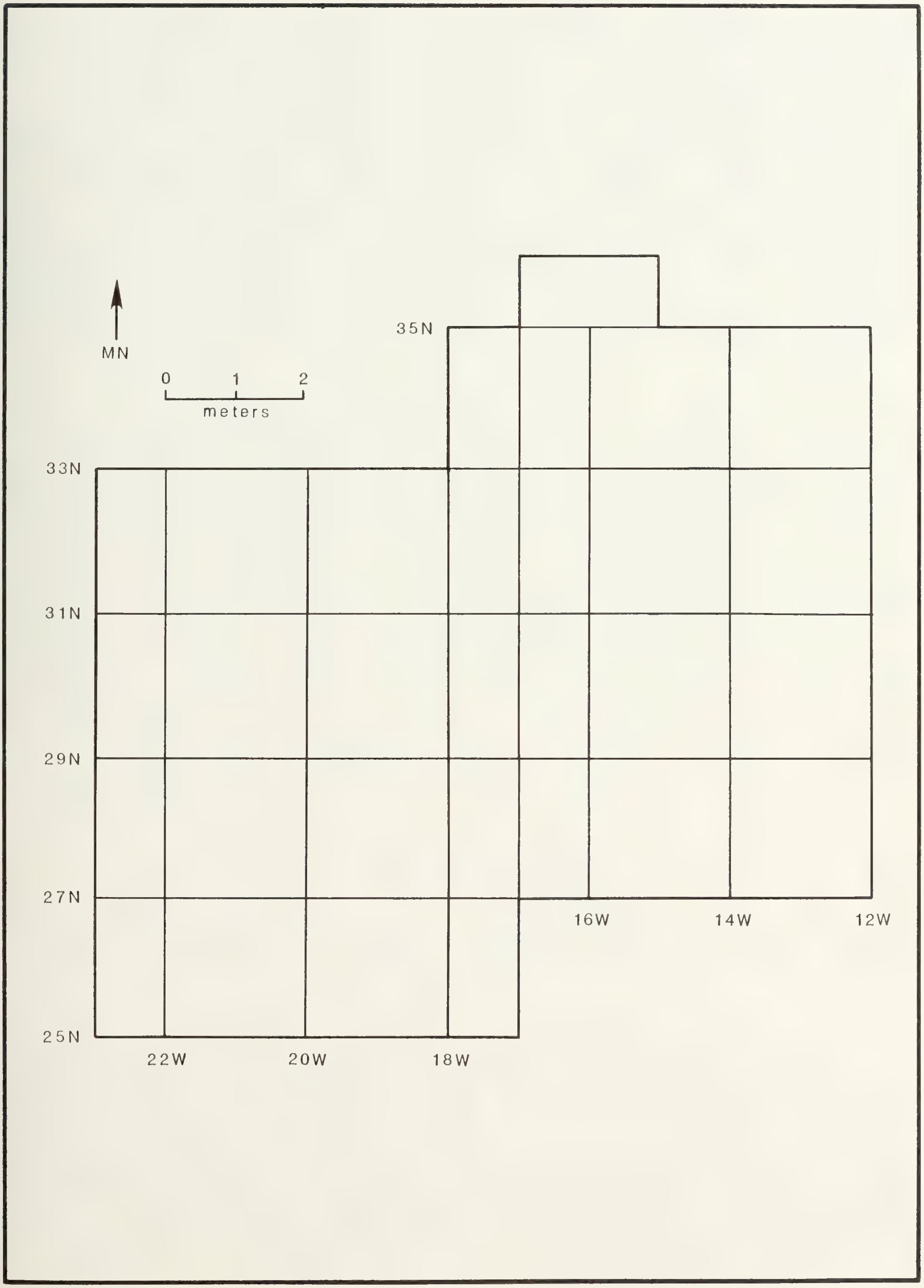


Figure 11. Plan map of Excavation Area B showing location and numbering of units.

southwest, or southeast quadrant of the 2 x 2 m unit. Because changes in the natural stratigraphy were difficult to discern and for more precise sorting of artifacts, the fill was removed in arbitrary 10 cm levels. Each 10 cm level within each 1 x 1 m unit was dug separately using shovels and trowels and was screened through ¼ inch hardware cloth.

Flaked stone tools, debitage, and other artifacts found in the screen were recorded and bagged by 1 x 1 m unit and 10 cm level. Each bag of debitage was given a separate field specimen (F.S.) number, as was each tool. This information was listed on the Archaeological Field Specimen Record and on the level form, which was completed for each level of a 2 x 2 m unit. Artifacts found in situ were plotted with exact horizontal and vertical provenience and each was given a different F.S. number. Animal bone and mussel shell were recorded similar to artifacts except that they were given ancillary study specimen (A.S.S.) numbers and listed on the Ancillary Study Specimen Record.

Feature and Occupation Floor Recording Procedures

When a pit feature was encountered, it was first completely exposed horizontally and then recorded with a plan view map and photographs. The features were usually distinguished from the surrounding matrix by darker stained fill. Because the upper surface of many was disturbed and deflated, the actual top was often difficult to discern. After delineating the plan view the feature was cross sectioned, and half of the fill was removed to determine if any internal stratification was present. Drawings and photographs were made of the resulting profile. Following this, the remainder of the fill was excavated. Samples of feature fill for pollen and plant macrofossil analyses were collected from each feature, and the remaining fill was screened through 1/16 inch hardware cloth. Once excavated, the empty pit again was photographed and mapped. Additionally, all pertinent information was put on a Feature Record form. Any fire-cracked rock present within the fill was counted and weighed for use in laboratory classification of feature types.

Fire-cracked rock concentrations and scatters were exposed and mapped for each 2 x 2 m unit; then the rocks were left in place until the entire cultural layer was excavated and recorded. This ensured that the associations between features, artifacts, and rocks were delineated correctly. For each 1 x 1 m unit, the fire-cracked rocks were counted and weighed during removal. Count and weight data were recorded for use in trend surface mapping. Pollen samples were taken from discernible occupation surfaces surrounding pit features. Up to four pollen samples were taken from around the pit features.

Stratigraphy Recording Procedures

The stratigraphic profiles were drawn and photographed for most walls of the block excavation areas. Additional cross sections were recorded from balks preserved within the blocks, when necessary, to understand changes in the the natural stratigraphy within the 10 x 10 m areas. The color, particle size, mineralogy, and calcium carbonate content of the deposits for each strata were indicated in the field with the profile drawing. From selective areas, pollen and sediment samples were taken from stratigraphic columns. These were continuous columns with sampling done in 5 cm intervals.

Ancillary Sample Recording Procedures

In addition to the recovery of occupational debris, such as artifacts and bone, samples were taken for pollen, plant macrofossil, sediment, and radiocarbon analyses. These samples were analyzed to obtain information on the paleoenvironment, the subsistence of the prehistoric inhabitants, and the time of year of site use. Sediment samples measuring 100-200 ml for the analysis of pollen were obtained from feature fill, occupation floors surrounding features, and stratigraphic columns. A single sample was collected from each pit feature, except for a large basin-shaped feature (Feature 30) where two samples were collected. The sample of feature fill was collected from the lower half of the feature and care was taken not to incorporate disturbed or introduced material. When a relatively undisturbed, i.e., nondeflated, occupation floor was found associated with the feature(s), it to was sampled. A single sample was drawn from the floor at a distance no greater than one meter from the feature. Feature 30 was an exception. Additional samples were collected from the occupation floor surrounding the feature (see Appendix D). A total of eight samples was collected from the north, south, and east sides. A backhoe trench precluded sampling the west side. Upon discovery, pieces of groundstone were covered with aluminum foil in anticipation of pollen analysis. Sediment samples of feature fill, midden areas, and occupation floors were also collected to analyze plant macrofossil remains. As with pollen sampling, all pit features were sampled. At a minimum, 1.5 liters was collected, and care was taken not to include rodent introduced material. As feature, volume increased, the size of the sediment sample also increased. The largest sample consisted of 22 liters from Feature 30. The entire contents of each feature could not be recovered because of handling time and expense. Sediment samples were taken from selected stratigraphic cross sections and consisted of a continuous column taken at 5 cm increments. These samples were collected for geochemical analysis to add in stratigraphic, geomorphological, and paleoenvironmental interpretations. Sediment samples for pollen analysis, also for paleoenvironmental reconstruction, were collected along with the samples for soil analysis as matched pairs. Charcoal from pit features, when present, was collected for radiocarbon age determintion.

LABORATORY METHODS

After the completion of fieldwork, all materials, including artifacts, debitage, bone, ancillary samples, and field records, were taken to Western Wyoming College, Rock Springs, for analyses and curation. All collected materials were processed, cataloged, and curated following the standard procedures of Archaeological Services of Western Wyoming College. The catalog numbers for the Taliaferro site consist of the prefix SCL14 followed by the artifact number; the SCL is the abbreviation for the Shute Creek Lake U.S.G.S. quadrangle on which the site is located and the 14 represents the site number on the map. This prefix is cross-referenced to 48LN1468, the state Smithsonian number for the site.

Each tool or modified object (e.g., beads and incised stone) and debitage recorded in situ was assigned a separate catalog number. Debitage recovered in the screen were given numbers by lot for each 1 x 1 m unit, 10 cm level. Animal bone and other ancillary specimens were numbered in a separate sequence noted by an additional prefix An. F.S. and A.S.S. Numbers recorded in the field were cross-referenced with the AS-WWC catalog numbers on the F.S. and A.S.S. forms and on the catalog sheets.

The features, flaked stone tools, groundstone, and other artifacts were described and analyzed according to the methods outlined below. Methods used to examine the spatial relationships of the archaeological remains, such as trend surface analysis, are also discussed. The descriptions and results of the analyses for features and artifacts are detailed in the appendices. The analysis of animal bone and ancillary samples were performed by specialists. Specific procedures used and the results are provided in the appropriate appendices.

Feature Analysis

The morphological descriptions and functional interpretations of the 32 pit features, the five fire-cracked rock concentrations, and the midden area are presented in Appendix A. The pit features were classified into eight morphological types (using plan view, cross section, volume, and surface area characteristics) as well as by the presence or absence of fire-cracked rocks or oxidation. Functional interpretations are based on content of fill and associated archaeological debris, such as fire-cracked rock, flaked stone tools, and groundstone.

Information on dimensions, plan views, cross sections, and quantity of rocks and oxidation for each feature was taken from the field notes. Volume and surface area was calculated using the following formulas:

$$\text{Volume} = \tfrac{1}{2}\ (4/3\ [\text{depth}]\ [\text{N-S dia.}/2]\ [\text{E-W dia.}/2])$$
$$\text{Surface area} = \quad r^2$$

Artifact Analysis

The flaked stone artifacts, groundstone, hammerstones, and nonutilitarian items recovered from the Taliaferro site were cataloged and analyzed following standard procedures of Archaeological Services of Western Wyoming College as detailed in Instructions for Cataloging Artifacts (AS-WWC 1983). The results of the analysis and detailed descriptions of each artifact type are provided in Appendix B.

As outlined in Appendix B, the flaked stone artifacts were analyzed within a technological scheme where artifacts are grouped according to their stage in the reduction continuum of stone tool manufacture. This reduction continuum includes a series of sequential steps from the collection of the raw material to the completion of the final implement. Each stage in the sequence is considered a separate artifact type, which is defined by certain technological and morphological attributes.

Three reduction sequences are evident in the collection from the Taliaferro site. One is the retouching or use of flakes that are removed from a cobble or core. Artifact classes resulting from this reduction strategy are cores, retouched flakes, and utilized flakes. The cores were divided into residual, multidirectional, and discoidal types, and the retouched flakes were broken down into several types based on the location of retouch, i.e., lateral and distal. The retouched flake types are reflective of tools generally referred to in the literature as scrapers, spokeshaves, and gravers, although these terms are not used. Another reduction strategy is the expedient modification of cobbles or pebbles for tools, and the resulting artifacts were classified as modified cobbles or pebbles. The third flaked stone tool production sequence is the reduction of bifaces into implements. Artifact classes included in the manufacturing continuum, from first to last stages, are preblanks, blanks, preforms, and end products. Using morphological shape, the end products from this sequence were divided into projectile points, drills, and notched knives.

In addition to descriptions of each artifact type, a primary focus of the analysis of the flaked stone artifacts other than projectile points was the examination of significant changes through time in the material type and size of the specimens in each category. The chi-square test (Nie et al. 1975) was used to see if significant differences in the material types exist between components. To measure the strength of relationship, the Cramer's V was calculated (Nie et al. 1975). This ranges between 0 and 1, with larger values signifying a higher degree of association. The Kruskal-Wallis one-way analysis of variance (Nie et al. 1975), a nonparametric test, was conducted to record whether the length, width, and thickness measurements are significantly different between components. Statistical analyses were performed on the University of Wyoming Cyber computer employing programs contained in the Statistical Package for the Social Sciences (SPSS) (Nie et al. 1975). AS-WWC's IBM-PCXT was employed in the creation and transmittal of data files for use on the Cyber.

Debitage containing a striking platform and bulb of force were grouped as either primary, secondary, or tertiary flakes depending on the amount of cortex on the dorsal surface. Those typed as primary flakes have at least 90% cortex, secondary flakes have 1 to 90%, and tertiary flakes lack cortex. Bifacial thinning flakes are distinctive tertiary flakes that display a lipped, double-faceted platform and contain evidence of crossing at least half way across the artifact face. Pieces of debitage that lack the attributes of the flakes and are chunky or blocky were classified as shatter. Debitage included as tested material are cobbles, pebbles, or chunks of raw material that exhibit three or fewer flake scars. The focus of the debitage analysis was the examination of differences between components in the cumulative percentage curves of the primary, secondary, and tertiary flakes. The relative percents of these flake types provide an estimation of the kind of reduction activities conducted at the site.

For the projectile points, the major concern of the analysis was the delineation of morphological types for chronological purposes. Using morphological attributes, including overall size, form of notch, and shape of base, the points were grouped into several descriptive categories which were then compared to similar morphological types detailed in the literature of the Great Basin, northern Colorado Plateau, and Great Plains.

Artifacts classified as hammerstones display some evidence of battering on one or more edges and contain at the most only two scars from accidental flake removal. Pieces of sandstone or quartzite that were ground or pecked were included in the groundstone category. The groundstone implements were divided into abrading stones, shaped manos, unshaped manos, basin metates, shaped slab metates, unshaped slab metates, and indeterminate groundstone s n s and the presence or absence of intentional shaping.

Specialist Analyses

The specialist analyses conducted on materials recovered from the Taliaferro site were plant macrofossil, pollen, animal remains, and sediment. A complete description of the methods and results of these analyses is provided in the appendices. Generally, these endeavors yielded information concerning the subsistence patterns of the prehistoric inhabitants, the season of site occupation, and the paleoenvironment of the site area. In addition to these studies, a magnetometer survey was conducted to access its usefulness as a tool in this region of Wyoming.

The plant macrofossil analysis of feature fill was conducted by Craig S. Smith, AS-WWC, and is described in Appendix C. Samples from 31 of the pit features at the Taliaferro site were floated and sorted for charred seeds. Each sample consisted of 1.5 to 22.5 liters of feature fill depending on the volume of the feature. The seeds recovered from each feature were counted and identified to specific taxa. The analysis was performed to obtain data on the kinds of food plants that were used by the prehistoric inhabitants. Evidence from the plant macrofossil analysis also provided clues about the season of occupation of the site.

The pollen analysis was performed by Linda J. Scott of Palynological Analysts, Denver, Colorado, and is reported in Appendix D. Analyzed samples were taken from two stratigraphic columns (N=40), feature fill (N=21), occupation surfaces surrounding the features (N=12), and washes from groundstone (N=10). In all, 165 sediment samples were collected for possible analysis. Of these, 73 were actually analyzed. Of the 64 grounstone artifacts collected, 10 were washed and analyzed for pollen. Ideally all pollen samples collected and all groundstone artifacts of sufficient size should be analyzed. This, however, generally is not the case since budgetary considerations are inevitable. For the Talliaferro site, samples were chosen that would provide the following: (1) a complete stratigraphic history of prehistoric pollen rain, (2) a complete range of feature types, (3) feature samples representing every component, and (4) a sample from each major activity area floor. The decision as to which groundstone pieces would be analyzed was primarily dependent upon the size and condition of the groundstone piece. The artifact had to have a washable working surface at least 50 cm^2 in size. Artifacts recovered from areas subjected to post occupation disturbance were excluded. A total of 100 to 200 pollen grains was counted and identified from each sample. The fluctuating percentages of the various pollen types in the samples from the stratigraphic column reflect changes in the vegetation at the site vicinity and region. These changes provide clues concerning shifts in the paleoclimate. High frequencies or aggregates of pollen from economically important plants found in feature fill, occupation floors, and groundstone suggest the kinds of plants processed and consumed.

Lynn L. Harrell, AS-WWC, analyzed the animal remains, which are discussed in Appendix E. The analysis focused on the interpretation of cultural behaviors, activities, and adaptations that are revealed in the attributes of the recovered bone. Among the recorded attributes are weight, natural modification, taxaonomic classification, anatomical element, portion of element present, side of body, sex, age, and cultural modification. The analysis provides information about the kinds of animals consumed, the processing methods, the relative importance of hunting in the subsistence base, and the time of year of site occupation.

The sediment was analyzed by J. C. Miller, AS-WWC, and is detailed in Appendix F. Samples from two stratigraphic columns, which coincided with the pollen samples, were analyzed to obtain data on the paleoenvironment and depositional history of the site. Sediment analysis included the assessment of grain size populations, organic carbon, total carbonates, pH, conductivity, angularity and spericity, and mineralogy.

A magnetometer survey was conducted by Holly Hathaway, Archaeometric Laboratory at Colorado State University, prior to site excavations. The methods and results are detailed in Appendix G. One magnetometer grid was placed over a portion of Excavation Area A and another was established off the site boundaries as a control. The survey was performed to test whether magnetic anomalies detacted by the magnetometer could predict cultural features from sites in southwest Wyoming.

Component and Trend Surface Analyses

The remains recovered from the excavations at the Taliaferro site were divided into eight archaeologically definable temporal units, or components. In the field these components were generally separated horizontally and vertically. Where clear distinction could not be made, the cultural remains were grouped into components using evidence from the natural stratigraphy, the stratigraphic position of radiocarbon dated pit features, the distribution of layers of fire-cracked rock, and debitage frequencies. This information was plotted on profiles for each excavation unit to facilitate the dividing process. Because the deposits at the site lacked culturally sterile layers between the various components, mixing of some material would have occurred. We are confident the majority of the remains were assigned to the correct component.

The horizontal distribution within the component of flaked stone artifacts, debitage, groundstone, and animal remains in relationship to facilities (non-portable artifacts) aid in the interpretation of the site and prehistoric lifeways and use of space. To visualize this distribution and relationship, plan and density maps for the excavation blocks and each component were generated. The plan maps depict the location of facilities, fire-cracked rock, and in situ artifacts as mapped in the field. Density maps of various classes of material were developed to visually display the distribution of these materials within each component. A technique refered to as trend surface analysis (Hodder and Orton 1976:155) was employed to calculate the density values. This method smooths the data (ca. 4 m^2 average method was used) so that maps showing graduated contours of density could be developed.

The resulting data and plan and density maps were used to identify activity or use areas, show their relationship, and assess function. In some instances it helped to confirm component separation. The combination of the two maps was used to produce a detailed map and analysis of selected activity areas.

CHAPTER 4

RESULTS

This chapter summarizes the results of the archaeological investigations at the Taliaferro site. A more detailed discussion of the analyses of the recovered material is provided in the appendices. First, the natural stratigraphy for the north and south halves of Excavation Area A and Excavation Area B is described. The next section concerns the cultural stratigraphy and radiocarbon ages resulting from the excavations. Also included are the definitions for the components and the basis for their separation. The rest of the chapter details (for each of the eight components) the features, artifacts, animal and plant remains, and when possible their spatial relationships.

NATURAL STRATIGRAPHY

The deposits at the Taliaferro site consist primarily of eolian materials that developed along the ridge separating Slate Creek and a seasonal tributary. On the ridge, some areas have experienced mostly aggradation and other locations are generally deflated, creating variations in the stratigraphy across the site. The north half of Excavation Area A, located in a swale at the head of a small south flowing ephemeral wash, has gone through several periods of deflation. This situation has resulted in deposits over 3000 years old being located just below the surface. In contrast, the south half of Excavation Area A, just south of the swale, did not experience intensive deflation and is characterized by aggrading eolian sands. Eolian deposits over a meter thick have accumulated over the past 2500 years as a shadow in the vicinity of Excavation Area A. A similar situation occurred in the vicinity of Excavation Area B, located on the portion of the ridge above Slate Creek. Again, eolian materials aggraded along the eastern side of the ridge. A detailed analysis of the sediment is presented in Appendix F.

Because of differences in the depositional history across the site, the stratigraphy of the north and south halfs of Excavation Area A and Excavation Area B is discussed separately. Overall, the lower strata are composed of compacted fine to medium sand containing high amounts of calcium carbonate. Above these strata are deposits of fine to medium sand containing charcoal flecks, fire-cracked rock, and other cultural debris. The upper strata are primarily of less compacted, fine to medium sand and generally lack cultural remains. Rodent burrows are evident in many areas.

North Half of Excavation Area A

The north half of Excavation Area A contains deposits dating between 5000 and 3000 years ago. The excavation area is capped along the western and southern edges by a thin stratum deposited in the last 1500 years. The rest of the depositional sequence (3000-1500 years ago) is for the most part missing due to deflation. The southern portion of the north half does contain some deposits dating from between 2800 and 1900 years ago. Using field observations of the color, texture, compactness, and calcium carbonate content, the deposits in the north half of Excavation Area A were divided into four strata (Figure 12). Samples for pollen and sediment analyses were taken from what is referred to as Stratigraphic Column 2. The results of the pollen analysis is detailed in Appendix D, and the sediments are described in Appendix F.

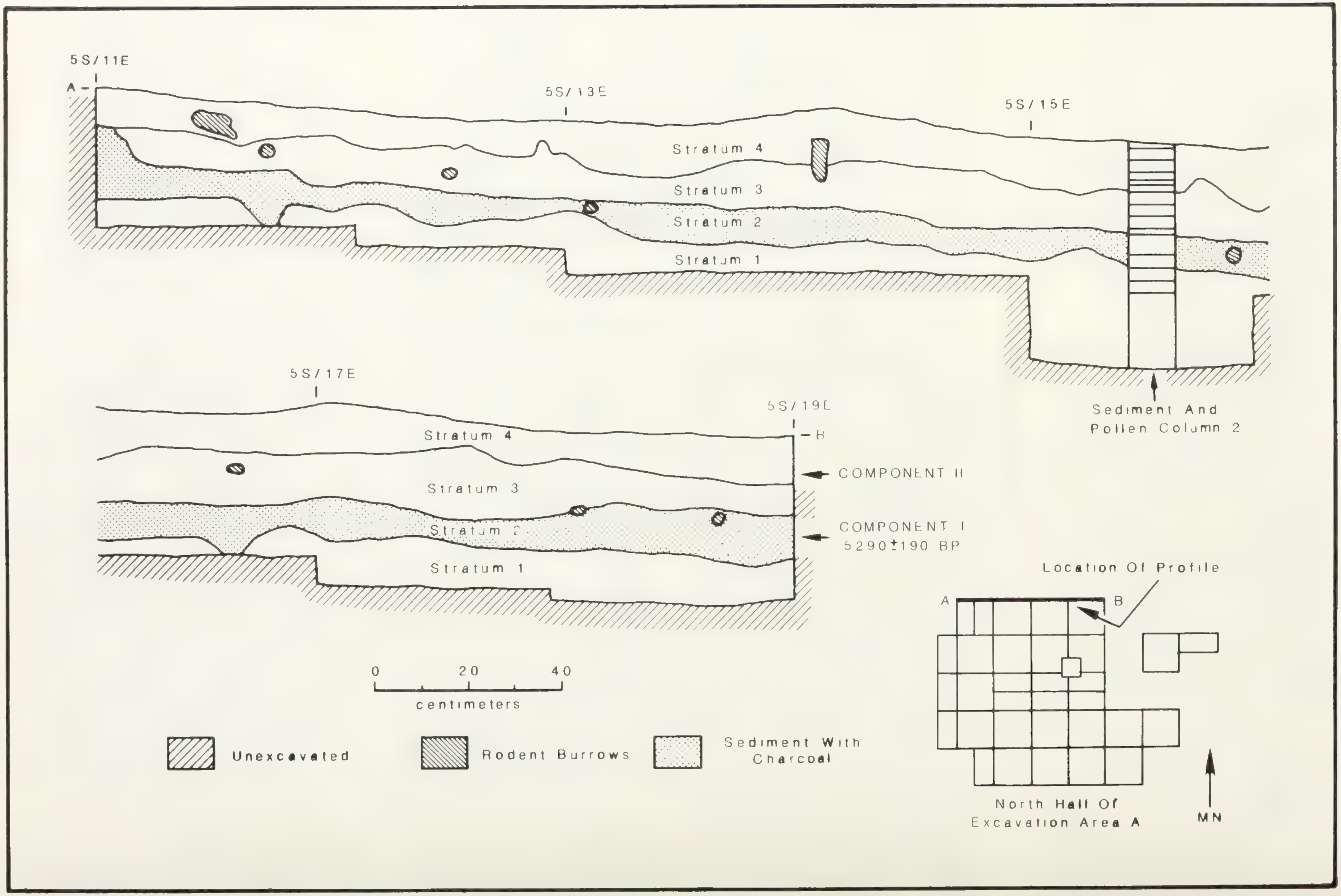


Figure 12. Representative profile from the north half of Excavation Area A, Taliaferro site.

Stratum 1, the deepest, is a light yellowish brown (10YR6/4), fine to medium sand. It is poorly sorted, compacted, and contains a large amount of calcium carbonate. An abundance of small gravels ranging from about 0.5 to 1.0 cm in diameter also is present within the stratum. The stratum dips to the southeast following the contour of the present surface of the swale. It underlies the deposits containing cultural material belonging to Component I (5290 years ago).

Stratum 2 is limited to the north half of Excavation Area A. It occurs above Stratum 1 and is a dark brown (10YR4/3), fine to medium sand. Cultural material, including charcoal flecks, fire-cracked rock, and debitage, is present throughout this stratum. This material belongs to the Early Archaic Component I dating to 5290 years ago. The deposits are moderately to poorly sorted, are fairly compacted, and contain a relatively large amount of calcium carbonate. The stratum is about 20 cm thick in the northern portion of the excavation area but becomes thinner to the south where it eventually disappears. It generally follows the contour of Stratum 1 and dips to the southeast.

Stratum 3 contains some cultural material mixed from Strata 2 and 4. It is a yellowish brown (10YR5/4), fine to medium sand that is compacted and moderately sorted. This stratum is about 20 cm thick and occurs throughout the excavation area. Much of the deposit is missing, probably due to deflation. It also generally follows the contour of the underlying strata and dips to the southeast.

Before the deposition of Stratum 4, apparently a considerable amount of deflation occurred across the swale sometime between 3000 and 2000 years ago. This deflation displaced much of the fire-cracked rock and other cultural material recovered from the contact of Stratums 3 and 4. The pattern and arrangement of the layer of fire-cracked rock encountered at the base of Stratum 4 is the result of this erosion. The deposits in the vicinity of the two Component II pit features were slightly less deflated. The fire-cracked rock layer and cultural material in the northern portion of the excavation belongs mostly to Component II and dates between 5000 and 3000 years ago. Some later material is also mixed into this stratum. Most of the cultural debris in the southern portion of the excavation area is associated with Component III (2800 to 1500 years ago).

Stratum 4 is a yellowish brown (10YR5/6), fine to medium sand that is slightly compacted and moderately to poorly sorted. It is about 20 cm thick and continues to the present ground surface of the swale. The stratum covers the north half of Excavation Area A and continues into the south half, where it is buried by deposits that have accumulated over the last 1500 years. In the south half of Excavation Area A it corresponds with Stratum 2 and displays more evidence of aggradation than deflation.

South Half of Excavation Area A

Instead of deflation, the south half of Excavation Area A is characterized by aggradation. The deposits containing cultural remains accumulated over the past 2800 years. The eolian material was deposited as a shadow along the southeastern slope of the ridge. Using field observation of the color, texture, compactness, and calcium carbonate content, the deposits in the south half of Excavation Area A were divided into five strata (Figure 13). Sediments over a meter thick have accumulate during the past 2800 years in the area of the profile shown in Figure 13. Samples for pollen and sediment analyses were taken from what is referred to as Stratigraphic Column 1. The

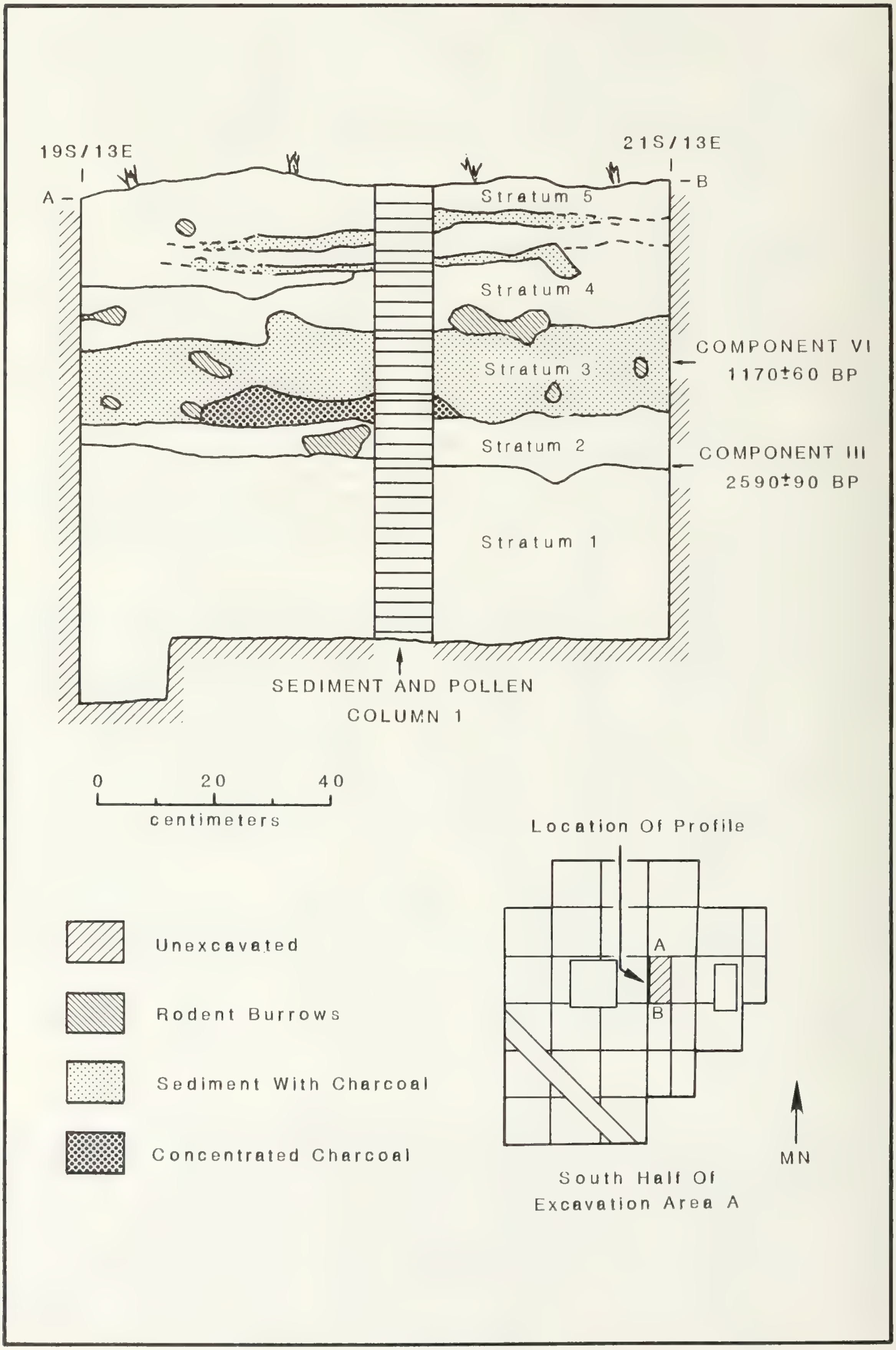


Figure 13. Representative profile from the south half of Excavation Area A, Taliaferro site.

results of the pollen analysis is provided in Appendix D, and the sediments are described in Appendix F.

Stratum 1 predates 2590 years ago and underlies the deposits containing material belonging to the Late Archaic aged Component III. It is a light yellowish brown (10YR6/4), fine to medium sand with some clay that is poorly sorted and poorly compacted. The stratum has large amounts of calcium carbonate and gravels ranging from 0.5 to 1.0 cm in diameter. In the area of the profile shown in Figure 13, the deposits continue to the base of the excavations and are over 60 cm thick. These deposits may correspond to Stratum 1 in the north half of Excavation Area A.

Associated with the Late Archaic Component III remains, Stratum 2 is a yellowish brown (10YR5/4), fine to medium sand with fire-cracked rock, some charcoal flecking, and other cultural debris. It is poorly sorted and contains clay and calcium carbonate. The stratum is about 20 cm thick and slopes to the east. It also continues into the deflated north half of Excavation Area A as Stratum 4, the stratum with the deflated fire-cracked rock layer.

Stratum 3 in most places is a dark grayish brown (10YR4/2), fine to medium sand that is poorly sorted. In the area of the profile shown in Figure 13, the stratum is part of a 30 cm thick midden deposit dating to the Late Prehistoric Component VI. It contains large amounts of charcoal, fire-cracked rocks, debitage, and other debris. At the base of the midden deposit, a concentrated area of charcoal is present. The midden formed in a natural basin that slopes to the southeast. Deposits belonging to Stratum 3 that surround the midden are lighter and thinner and slope toward the midden in the natural basin. The stratum incorporates sediments dating between 1500 to 900 years ago, which represent Component VI.

Postdating 900 years ago, Stratum 4 overlies Stratum 3 for most of the south half of Excavation Area A. In the area of the profile, it is about 20 cm thick and increases in thickness to the east. The stratum is composed of yellowish brown (10YR5/4), fine to medium sand that is poorly sorted. Only a few scattered pieces of debitage were recovered and are most likely mixed from the Late Prehistoric period remains from below.

Stratum 5 is a brown (10YR5/3), uncompacted, fine to medium sand that is poorly sorted. Within the stratum there are two thin (less than 6 cm thick) lenses of dark sediment with charcoal flecking; however, they lack other cultural remains. The stratum is about 30 cm thick and continues to the present ground surface. The stratum generally increases in thickness to the east.

Excavation Area B

Excavation Area B, located on the portion of the ridge just above Slate Creek, contains deposits with cultural remains that have accumulated over the past 1500 years. As with the south half of Excavation Area A, the deposits developed as a sand shadow on the northeastern slope of the ridge. The strata increase in thickness toward the northeast. Several of the strata, especially those with cultural material, pinch out toward the southwest or ridge crest. Using field observations of the color, texture, compactness, and calcium carbonate content, the deposits in Excavation Area B were divided into four strata (Figure 14). Most of cultural material was found in Stratum 2, which was divided into three Late Prehistoric components.

Stratum 1 is a yellowish brown (10YR5/4), fine to very course sand that is compacted and poorly sorted. It has large amounts of calcium carbonate and

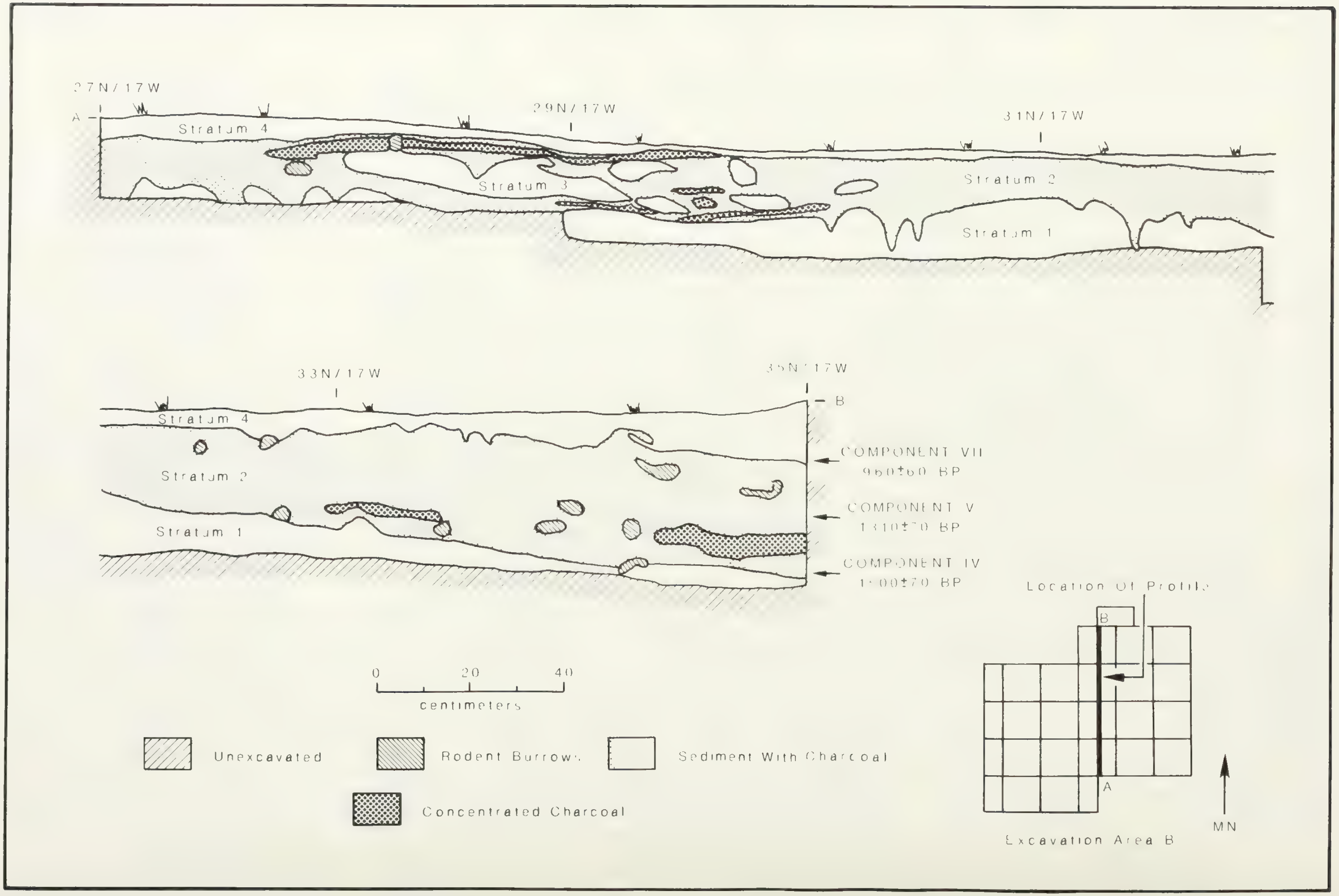


Figure 14. Representative profile from Excavation Area B, Taliaferro site.

gravels that range from 0.5 to 1.0 cm in diameter. Though below the layer with most of the cultural remains, several pit features from the base of Stratum 2 were dug into this lower stratum. Some debitage and fire-cracked rock were mixed into Stratum 1 as well. The stratum slopes down to the northeast where it becomes more deeply buried.

Most of the cultural debris, including fire-cracked rock, charcoal flecking, pit features, flaked stone artifacts, and debitage, from Excavation Area B are associated with Stratum 2. It is a dark grayish brown (10YR4/2), fine to medium sand that is poorly to moderately sorted and relatively compacted. The stratum is less than 10 cm thick in the western portion of the excavation block and over 50 cm thick in the northeastern corner of the block. It also slopes down to the northeast where it is deeply buried by Stratum 4. The cultural remains were divided into three components: those at the base of the stratum were included as Component IV dating to 1500 years ago, the material in the middle belongs to Component V with an age of 1300 years ago, and the remains from the upper portion were designated as Component VII dating to 960 years ago. Within this stratum, several concentrations of charcoal are also present.

Stratum 3 is a discontinuous layer that occurs within Stratum 2. It is a brown (10YR5/3), fine to medium sand that is moderately sorted. Charcoal flecks from above and below are mottled within the stratum. It is, at the most, 15 cm thick.

The upper layer, Stratum 4, is composed of a yellowish brown (10YR5/4) fine to course sand that is uncompacted and poorly sorted. Toward the northeast, the stratum increases in thickness to about 50 cm; and in the southwest corner, it is only about 5 cm thick. Cultural remains belonging to Component VIII were found in this stratum, but they are limited to only the northeast corner of the excavation area. Charcoal flecks and other debris from Component VII is mixed into Stratum 4 as well.

CULTURAL STRATIGRAPHY AND RADIOCARBON AGES

The remains recovered from the excavations at the Taliaferro site were divided into eight archaeologically definable temporal units, or components, that were separated horizontally and, in some instances, vertically (Figures 15 and 16). Each component may represent more than one incident of use, but finer divisions were undiscernible in the archaeological record. The cultural remains were grouped into components using evidence from the natural stratigraphy, the stratigraphic position of radiocarbon dated pit features, the distribution of layers of fire-cracked rock, and debitage frequencies.

Radiocarbon Age Estimates

Table 1 details the radiocarbon age estimates obtained from charcoal and sediment samples from pit features. The age of 5290 ± 190 years is based on a sample of 0.2 g of carbon collected from the bottom of Feature 21, which was directly over and only a few centimeters above Feature 25. Material from both features was badly mixed and disturbed due to rodents, and the small amount of charcoal could have originated from either feature. Most likely, using evidence from associated projectile points and other artifacts, the date corresponds with the age of Feature 25, which belongs to the Early Archaic Component I. This date will be used to mark the initial occupation at the site. Another feature associated with Component I, Feature 19, lacked

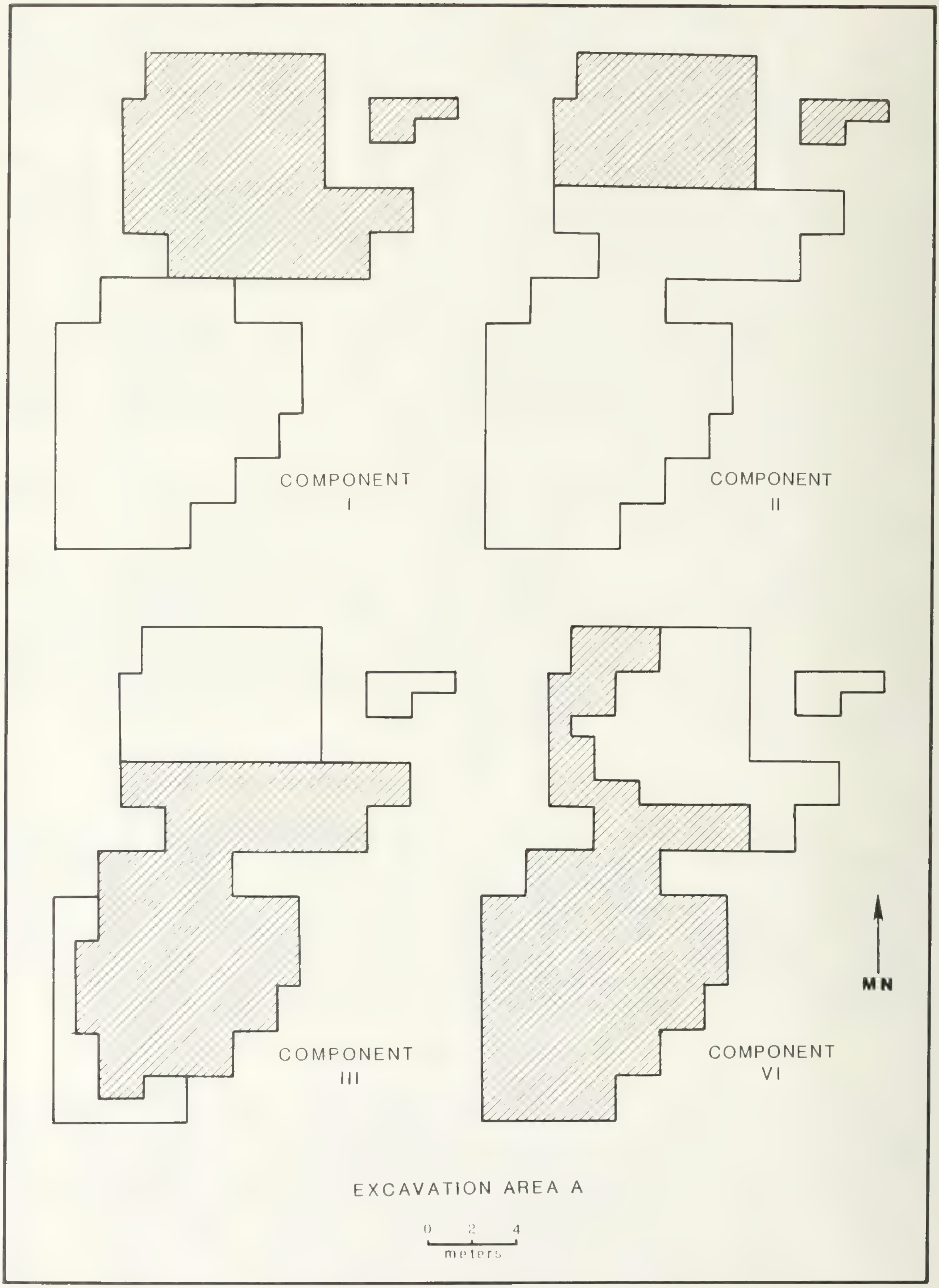


Figure 15. Plan maps of Excavation Area A showing the horizontal extent of Components I, II, III, and VI, Taliaferro site.

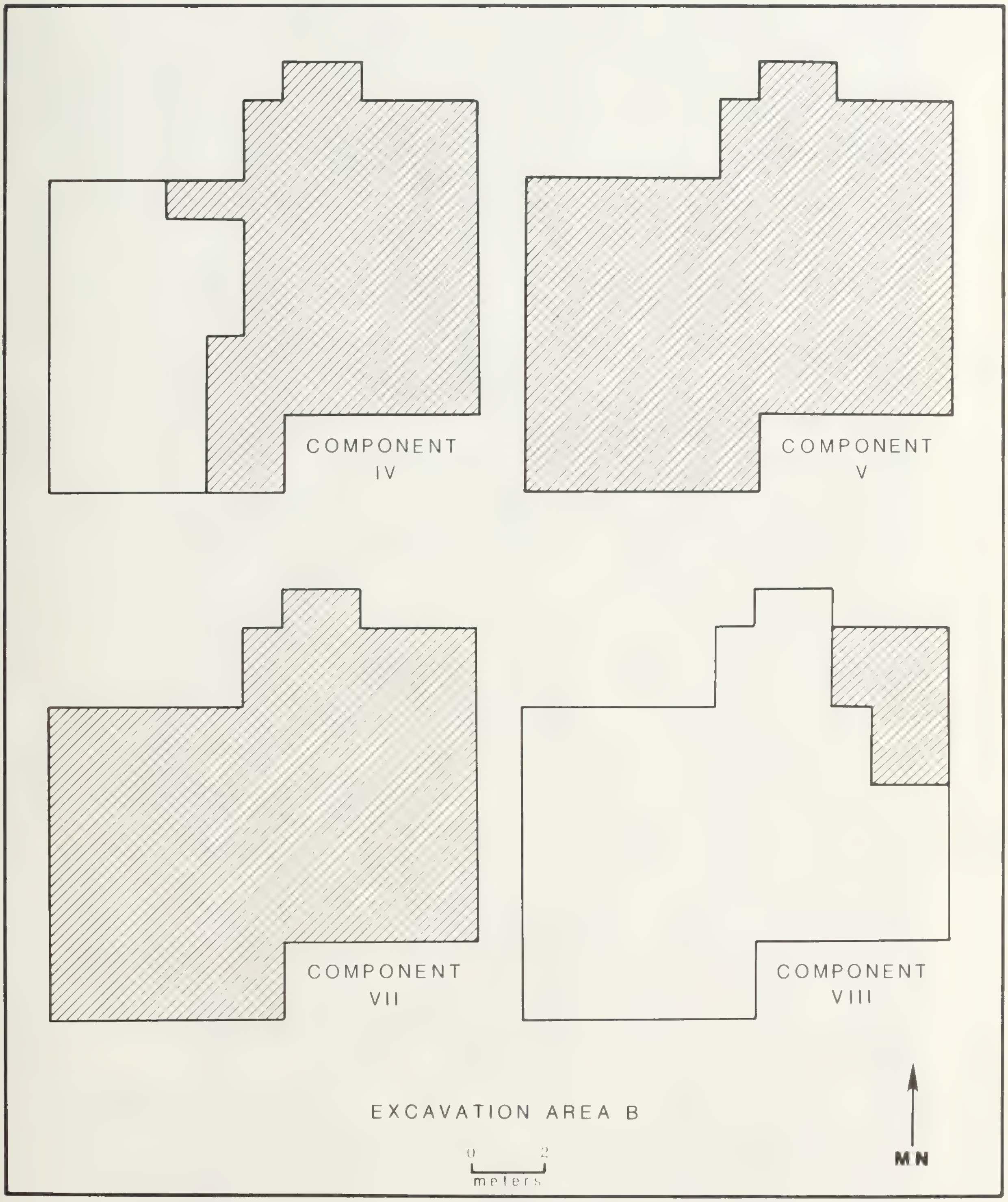


Figure 16. Plan maps of Excavation Area B showing the horizontal extent of Components IV, V, VII, and VIII, Taliaferro site.

Table 1. Radiocarbon age estimates from the Taliaferro site.

Component	Feature Number	Lab Number	C-14 age (Years B.P.)	Material
I/II*	21/25	Beta-13013	5290 ± 190	Charcoal
III	38	Beta-13014	2850 ± 90	Charcoal
III	28	Beta-10925	2590 ± 90	Sediment
III	20	Beta-13516	1910 ± 110	Charcoal
IV	17	Beta-13009	1500 ± 70	Charcoal
V	14	Beta-13010	1310 ± 70	Charcoal
VI	30	Beta-13012	1170 ± 60	Charcoal
VII	22	Beta-13011	960 ± 60	Charcoal

* Probably belongs to Component I.

sufficient charcoal for a radiocarbon age estimate. This also was true for Feature 13, the only other feature from Component II.

Three stratigraphically associated pit features belonging to the Late Archaic Component III have radiocarbon age estimates ranging between 2850 and 1910 years ago. The wide span of these dates indicates that the site probably was reused a number of times during this period though these different incidences of use could not be separated in the archaeological record. The Late Prehistoric Components IV, V, and VII from Excavation Area B each contain one radiocarbon dated pit feature. These age estimates correspond to the stratigraphic relationships of the pit features. The deepest, Feature 17 from Component IV, has an age of 1500 years before present (B.P.). Feature 14, belonging to Component V and stratigraphically above Component IV, has a date of 1310 years B.P. Feature 22 from Component VII, the uppermost dated component, has a date of 960 years B.P. The small, ephemeral Component VIII in the northeast corner of Excavation Area B is above the other three, but it lacked pit features and charcoal for radiocarbon estimates. Based on the stratigraphic position, Component VIII is the most recent component at the site. Component VI is the single Late Prehistoric component from Excavation Area A and has a radiocarbon age estimate of 1170 years ago from Feature 30; however, this area of the site probably was occupied through most of the Late Prehistoric period.

Component Definitions

The Early Archaic Component I represents the initial occupation at the Taliaferro site based on our excavations and occurs throughout the north half of Excavation Area A (Figure 15). Most artifacts, debitage, and fire-cracked rock from this component were found within a roughly 20 cm thick layer that was grayer than the deposits above or below it (Figure 17). Separating this gray lense from the upper fire-cracked rock layer belonging to later components was a deposit about 20 cm thick, which lacked fire-cracked rock and contained only low frequencies of debitage. Material in the lower half of the 20 cm thick deposit was included in Component I, but the debitage from the upper 10 cm was considered in the components associated with the upper fire-cracked layer. The small amounts of debitage found below the gray layer also were grouped with Component I. Overall, Component I is a well separated and distinct entity that contains little mixing of material from later occupations.

Figure 17. North half of Excavation Area A showing excavations near completion at the base of Component I. The lower gray layer evident in the profile is associated with Component I.

Above and separated from the Early Archaic Component I, a layer of fire-cracked rock covers the north half of Excavation Area A (Figure 18). The distribution of the fire-cracked rock, artifacts, and other debris is mostly the result of erosion, probably due to water running through the small swale that crosses this portion of the site. The head of the swale appears to be along the western edge of the excavation block, and its southern side is along the southern portion of the block where eolian deposition, instead of erosion, has occurred. This eroded surface represented by the layer of fire-cracked rock is about 10 to 20 cm below the present ground surface. It was horizontally divided between two components; the eroded northern portion was considered as belonging to the Middle Archaic Component II, and the southern part, displaying evidence of deposition, was included in the Late Archaic Component III, which continues throughout most of the south half of Excavation Area A (Figure 15). The line between these two components is somewhat arbitrary, and mixing of material has occurred.

The Middle Archaic Component II is the most eroded and disturbed component at the site. Except for the areas around Features 13 and 21, which occur slightly below the fire-cracked rock layer, most of the archaeological remains are associated with the eroded surface in the swale. This component incorporates the upper 10 cm of the 20 cm thick deposit that separates it from Component I, the 10 cm deposit containing the rocks and other debris, and (for most of the area) the remaining 10 cm to the present surface. The southern edge of the component fades horizontally into Component III and lacks a distinct boundary. Material from later occupations probably is mixed with that from Component II.

The Late Archaic Component III horizontally extends south from the edge of Component II in the north half of Excavation Area A and covers most of the south half of Excavation Area A (Figure 15). The archaeological remains included in this component occur in the eolian material that developed as a shadow along the southern side of the small swale. At the northern extent of Component III, the material is only about 10 to 20 cm below the present ground surface and is associated with the eroded fire-cracked rock layer that blends into Component II to the north. In this area it is eroded and disturbed, and the remains are mixed partly with those of the earlier Component II and the later Component VI.

To the south, in the south half of Excavation Area A, the material associated with Component III becomes more deeply buried as the thickness of the sand shadow increases (Figure 19). The component occurs about 70 cm below the present ground surface in the western or upslope side of the excavation block and over 100 cm deep along the eastern or downslope portion. Component III in this area is fairly discrete and intact and is separated from the later Component VI in most places by at least 10 cm of deposits containing low frequencies of debitage. Within this 10 cm deposit, some mixing of the remains from the two components has occurred; but the boundary between the components was quite clear over much of the excavation block and most of the material probably was assigned to the correct component. The fire-cracked rock and other debris belonging to Component III were limited mostly to a 10 cm thick deposit which sloped down from west to east. The small quantity of material recovered from the deposits 10 cm above and below this layer also was included. Along the extreme western and southern edges of the excavation block, the cultural deposits sloped up steeply to the west and lacked material associated with this component. In the south half of Excavation Area A, no remains from Components I or II were encountered although some units were excavated more than 60 cm below those of Component III.

Figure 18. Plan map of the north half of Excavation Area A showing the distribution of fire-cracked rock across the eroded surface, Taliaferro site.

Figure 19. Excavation Area A showing Component III excavations in progress. The dark stain evident in the profile of the control block is part of the midden associated with Component VI.

The final component delineated in Excavation Area A is the Late Prehistoric Component VI. It is present throughout the south half of the excavation block and along the western and southern edges of the north half (Figure 15). In the north half of the excavation area, the component is represented by an ephemeral layer of artifacts and debitage occurring in the first 10 cm below the present ground surface. Though these remains are stratigraphically associated with those in the south half of the excavation block, there is no indication as to what portion of the Late Prehistoric period they belong. In places this material is mixed with that from earlier components.

Because of the extensive deposition of eolian material as a shadow along the south half of Excavation Area A, large quantities of archaeological material belonging to Component VI is present in deposits over 60 cm thick in places. These remains represent several occupations occurring throughout the Late Prehistoric period, but finer divisions were undiscernible across the entire area. Some of these occupations probably have ages similar to the Late Prehistoric Components IV, V, and VII delineated in Excavation Area B. However, the occupation associated with Feature 30, a large stratified basin with an age of 1170 years ago in Excavation Area A, dates to a period between Components V and VII. For the spatial analysis, the remains of this occupation were separated from the others as much as possible. This created a three-fold division of the Component VI deposits; the deposits belonging with Feature 30 are sandwiched between those containing earlier and later material.

All the deposits from the top of Component III to the present ground surface were included in Component VI. In places these deposits are over 100 cm thick; however, the upper 30 or 40 cm yielded only a few isolated pieces of debitage and are above the deposits containing more concentrated remains. As with Component III, the deposits slope down from west to east and are thickest along the eastern edge of the excavation block. There is probably some slight mixing of material at the contact with Component III, especially in the eastern portion of the excavation block where much of the deposits were disturbed due to rodents. This mixing, however, does not affect the overall interpretations for the component.

The remaining four components at the site were defined from the excavations in Excavation Area B, and all belong to the Late Prehistoric period. All are contained within the dark midden deposit that crosses the excavation block and were grouped using discrete layers of fire-cracked rock and obvious lenses within the midden. The deposits slope down to the northeast with the thickest, about 100 cm thick, occurring in the downslope portion of the excavation block. Because the deposits are relatively shallow, averaging about 50 cm thick with debitage throughout, there is some mixing of the remains between components.

Component IV, the earliest Late Prehistoric component at the site, consists of pit features, fire-cracked rock, and other debris located at the base and just below the dark midden deposit. In most places this component is about 20 cm thick. Horizontally it covers the eastern half of the excavation block (Figure 16). No material belonging to this component was present in the shallow deposits in the western portion. The fire-cracked rock at the base of the midden formed a discrete layer, and a break with the later Component V deposits was evident by lower debitage frequencies. Remains from Component IV were the deepest encountered during the excavations in this block; units dug below these deposits lacked archaeological material.

The remains of Component V occur throughout the excavation block just above those of Component IV in the eastern half and at the base of the deposits containing cultural material in the shallower western portion (Figure 16). In the eastern half, this component was marked by a layer of fire-cracked rock in the center of the midden deposits. Additionally, a distinct lense was evident in some places within the midden. The component incorporates about 20 cm of deposits and is sandwiched between Components IV and VII. Due to the shallowness of the deposits, about 20 cm thick, along the extreme western portion of the excavation area there is some mixing with the later Component VII.

Component VII is just above the Component V deposits throughout the excavation area (Figure 16). It consists of a layer of fire-cracked rock located at the top and just above the midden and is generally about 20 cm thick. Except for the northeast corner of the block where Component VIII is evident, Component VII includes deposits to the present ground surface. Material in the shallower western portion is partly disturbed and mixed with earlier components due to erosion.

The most recent component at the site, Component VIII, is present only as a ephermal layer about 20 cm thick in the northeastern portion of the excavation area (Figure 16). It is above Component VII and is just below the present ground surface.

RESULTS BY COMPONENT

The results of the excavations are summarized below by component. This includes a description of the features; the flaked stone artifacts; the groundstone; other artifacts; animal and plant remains; and, when possible, the spatial relationships. A more detailed discussion of the analyses for each of these remains is provided in the appropriate appendix.

Component I

The Early Archaic Component I represents the initial occupation at the Taliaferro site and dates to 5290 years ago. It occurs throughout the north half of Excavation Area A and is approximately 50 cm below the present ground surface. Horizontally this component covers 102 m² of excavated area. Component I is a fairly intact, distinct entity that exhibits little mixing of material from later occupations.

Features

Features 19 and 25 were the only pit features associated with Component I (Table 2). Both were classified as small basins because of small volume and the absence of fire-cracked rock or oxidation (Appendix A). They contained a gray matrix and had irregular plan views due to some deflation. Feature 19 lacked charcoal and charred plant macrofossils. Feature 25 was much disturbed by rodents, and only a few small charcoal flecks and one charred sedge (*Carex* sp.) seed were recovered. Pieces of debitage were found in both features, but neither produced flaked stone artifacts or bone. Figure 20 shows Feature 19 with associated artifacts and fire-cracked rock before excavation, and Figure 21 illustrates the feature after excavation. Several small and quite deflated gray stains occurred in the area between the two features.

Because of the deflated nature of the two features and the lack of remains from the fill, interpretations about their functions are difficult to make. They probably served as hearths which were made in small, prepared basins. The paucity of charred plant macrofossils, the lack of bone and

Table 2. Characteristics of pit features, Component I, Taliaferro site.

Feature No.	Type	Volume (liter)	Area (cm^2)	Artifacts	Debitage (total)	Bone No.	Bone wt.(g)	Plant Macro-fossils[a]	Charcoal[b]
19	Small Basin	8.0	1134.0	-	3	-	-	0	none
25	Small Basin	7.0	1886.0	-	14	-	-	1	little

[a]Number of taxa

[b]Relative amount

fire-cracked rock within the fill, the presence of debitage within the fill, and the distribution of flaked stone artifacts and debitage around the features indicate that the production of flaked stone artifacts was a major activity in this area. The presence of pricklypear (Opuntia sp.) pollen in both features suggests that the stems or fruits of this plant were cooked in the area. Further discussion of the types of activities conducted at the site during Component I times will be presented in Chapter 5.

Flaked Stone Artifacts

A total of 133 flaked stone artifacts and 11,478 pieces of debitage was recovered from Component I deposits. These include 9 projectile points, 1 drill, 2 final biface tips, 13 large preforms, 8 preform fragments, 25 blanks, 30 preblanks, 6 indeterminate bifaces, 16 retouched flakes, 7 utilized flakes, 4 modified cobbles and pebbles, and 12 cores (Table 3). A complete analysis of these artifacts, along with definitions and descriptions for each of the types, is provided in Appendix B. Figures 22 and 23 illustrate an example of the flaked stone artifact types from Component I.

The projectile points belonging to Component I were classified as Types I and II large, side-notched. All seven Type I side-notched points from the Taliaferro site were found in Component I. Four are of quartzite, one is of translucent algalitic chert, and, interestingly, two are of obsidian; only one other artifact, a preform fragment from this component, is of obsidian. Type I points resemble points that are often referred to as Northern, Bitterroot, or Mummy Cave Side-notched (Gruhm 1961; McCraken et al. 1978; Swanson et al. 1964). These points have a fairly wide distribution throughout the northern United States and roughly date between 7000 and 5000 years ago, which corresponds to their age at the Taliaferro site.

The remaining two projectile points are Type II large, side-notched. In addition to Component I, this type also was recovered from the Middle and Late Archaic Components II and III. They are similar to those referred to as Elko Side-notched in the archaeological literature of the Great Basin (Heizer et al. 1968). In the eastern Great Basin and northern Colorado Plateau, Elko Side-notched points have a long time span, dating between 6000 and 3200 years ago (Holmer 1986). At the Taliaferro site, they range in age from about 5200 to 1900 years ago.

Figure 20. Feature 19, a small basin, before excavation, with associated flaked stone artifacts and fire-cracked rock, Component I, Taliaferro site.

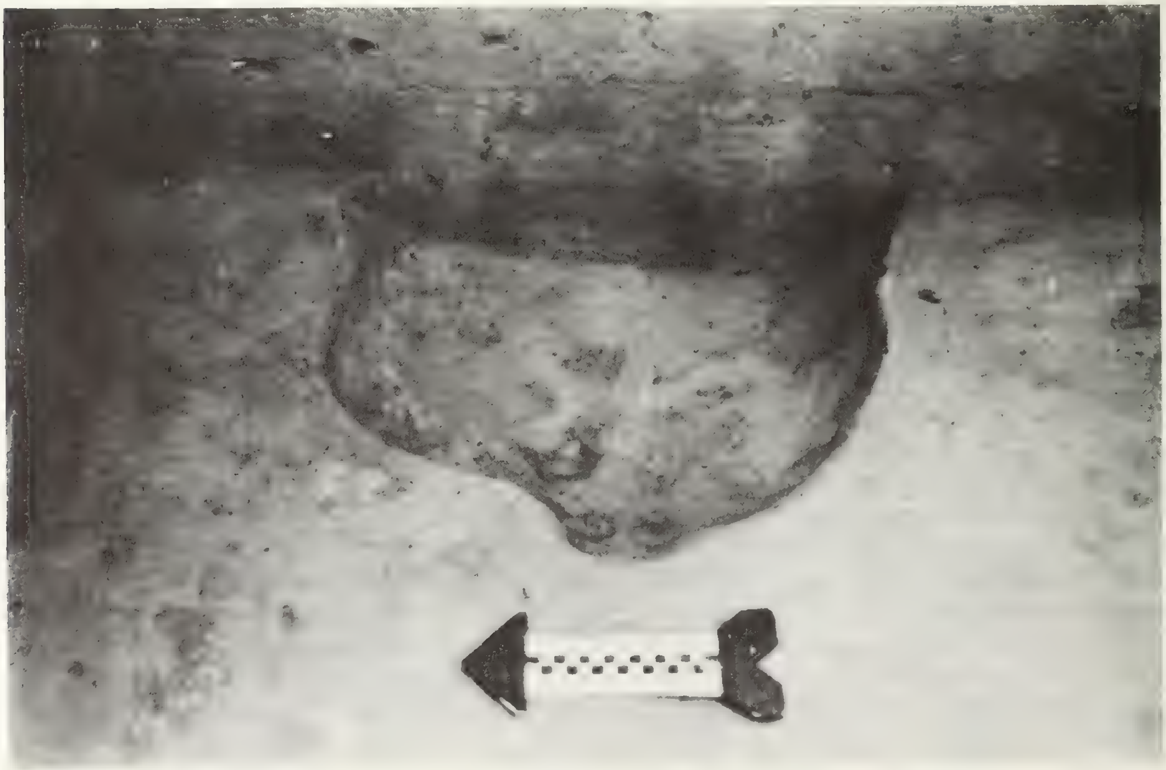


Figure 21. Feature 19, a small basin, after excavation, Component I, Taliaferro site.

Table 3. Crosstabulation of flaked stone artifact type by material type, Component I, Taliaferro site.

Artifact Type		Translucent Chert	Opaque Chert	Quartzite	Moss Agate	Whiskey Buttes Chert	Obsidian	Total
Large, Side-notched Point, Type I	#	1	0	4	0	0	2	7
	Row %	14.3	0	57.1	0	0	28.6	5.3
	Column %	3.2	0	6.5	0	0	66.7	
	Total %	0.8	0	3.0	0	0	1.5	
Large, Side-notched Point, Type II	#	1	0	1	0	0	0	2
	Row %	50.0	0	50.0	0	0	0	1.5
	Column %	3.2	0	1.6	0	0	0	
	Total %	0.8	0	0.8	0	0	0	
Drill	#	0	1	0	0	0	0	1
	Row %	0	100.0	0	0	0	0	0.8
	Column %	0	4.0	0	0	0	0	
	Total %	0	0.8	0	0	0	0	
Final Biface Tip	#	0	1	1	0	0	0	2
	Row %	0	50.0	50.0	0	0	0	1.5
	Column %	0	4.0	1.6	0	0	0	
	Total %	0	0.8	0.8	0	0	0	
Large Preform	#	0	2	11	0	0	0	13
	Row %	0	15.4	84.6	0	0	0	9.8
	Column %	0	8.0	17.7	0	0	0	
	Total %	0	1.5	8.3	0	0	0	
Preform Fragments	#	1	1	3	1	1	1	8
	Row %	12.5	37.5	12.5	12.5	12.5	12.5	6.0
	Column %	3.2	4.0	4.8	25.0	12.5	33.3	
	Total %	0.8	0.8	2.3	0.8	0.8	0.8	
Blank	#	3	5	15	1	1	0	25
	Row %	12.0	20.0	60.0	4.0	4.0	0	18.8
	Column %	9.7	20.0	24.2	25.0	12.5	0	
	Total %	2.3	3.8	11.3	0.8	0.8	0	
Preblank	#	16	3	7	1	3	0	30
	Row %	53.3	10.0	23.3	3.3	10.0	0	22.6
	Column %	51.6	12.0	11.3	25.0	37.5	0	
	Total %	12.0	2.3	5.3	0.8	2.3	0	
Indeterminate Biface	#	3	1	2	0	0	0	6
	Row %	50.0	16.7	33.3	0	0	0	4.5
	Column %	9.7	4.0	3.2	0	0	0	
	Total %	2.3	0.8	1.5	0	0	0	
Distal Retouched Flake, Type I	#	2	2	1	0	0	0	5
	Row %	40.0	40.0	20.0	0	0	0	3.8
	Column %	6.5	8.0	1.6	0	0	0	
	Total %	1.5	1.5	0.8	0	0	0	
Distal Retouched Flake, Type II	#	0	1	1	0	1	0	3
	Row %	0	33.3	33.3	0	33.3	0	2.3
	Column %	0	4.0	1.6	0	12.5	0	
	Total %	0	0.8	0.8	0	0.8	0	
Distal Retouched Flake, Type III	#	0	0	1	0	0	0	1
	Row %	0	0	100.0	0	0	0	0.8
	Column %	0	0	1.6	0	0	0	
	Total %	0	0	0.8	0	0	0	

Table 3. Concluded.

Artifact Type		Translucent Chert	Opaque Chert	Quartzite	Moss Agate	Whiskey Buttes Chert	Obsidian	Total
		Material Type						
Lateral Retouched Flake, Type I	#	1	0	1	0	0	0	2
	Row %	50.0	0	50.0	0	0	0	1.5
	Column %	3.2	0	1.6	0	0	0	
	Total %	0.8	0	0.8	0	0	0	
Lateral Retouched Flake, Type II	#	0	1	0	0	0	0	1
	Row %	0	100.0	0	0	0	0	0.8
	Column %	0	4.0	0	0	0	0	
	Total %	0	0.8	0	0	0	0	
Notched Flake	#	0	1	0	0	0	0	1
	Row %	0	100.0	0	0	0	0	0.8
	Column %	0	4.0	0	0	0	0	
	Total %	0	0.8	0	0	0	0	
Graver	#	0	0	0	0	1	0	1
	Row %	0	0	0	0	100.0	0	0.8
	Column %	0	0	0	0	12.5	0	
	Total %	0	0	0	0	0.8	0	
Irregular Retouched Flake	#	0	1	1	0	0	0	2
	Row %	0	50.0	50.0	0	0	0	1.5
	Column %	0	4.0	1.6	0	0	0	
	Total %	0	0.8	0.8	0	0	0	
Utilized Flake	#	2	2	3	0	0	0	7
	Row %	28.6	28.6	42.9	0	0	0	5.3
	Column %	6.5	8.0	4.8	0	0	0	
	Total %	1.5	1.5	2.3	0	0	0	
Modified Cobble and Pebble	#	0	0	4	0	0	0	4
	Row %	0	0	100.0	0	0	0	3.0
	Column %	0	0	6.5	0	0	0	
	Total %	0	0	3.0	0	0	0	
Residual Core	#	0	0	0	1	0	0	1
	Row %	0	0	0	100.0	0	0	0.8
	Column %	0	0	0	25.0	0	0	
	Total %	0	0	0	0.8	0	0	
Multidirectional Core	#	1	3	6	0	1	0	11
	Row %	9.1	27.3	54.5	0	9.1	0	8.3
	Column %	3.2	12.0	9.7	0	12.5	0	
	Total %	0.8	2.3	4.5	0	0.8	0	
Total	#	31	25	62	4	8	3	133
	%	23.3	18.8	46.6	3.0	6.0	2.3	100.0

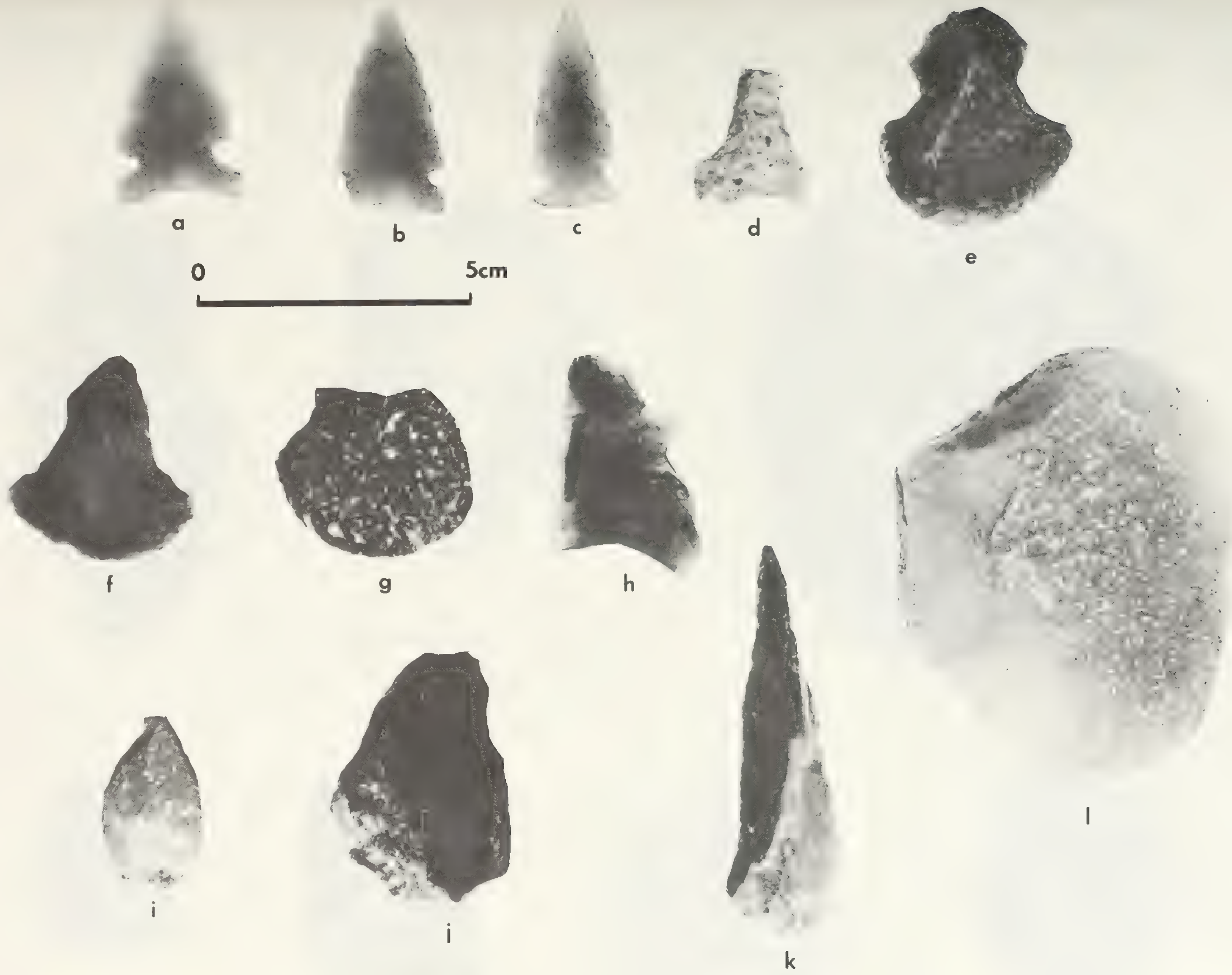


Figure 22. Example of flaked stone artifact assemblage from Component I, Taliaferro site. a-b, Large, side-notched projectile point, Type I; c, Large, side-notched projectile point, Type II; d, Drill; e-f, Distal retouched flake, Type I; g, Distal retouched flake, Type II; h, Lateral retouched flake, Type I; i, Lateral retouched flake, Type II; j, Notched flake; k, Graver; l, Distal retouched flake, Type III.

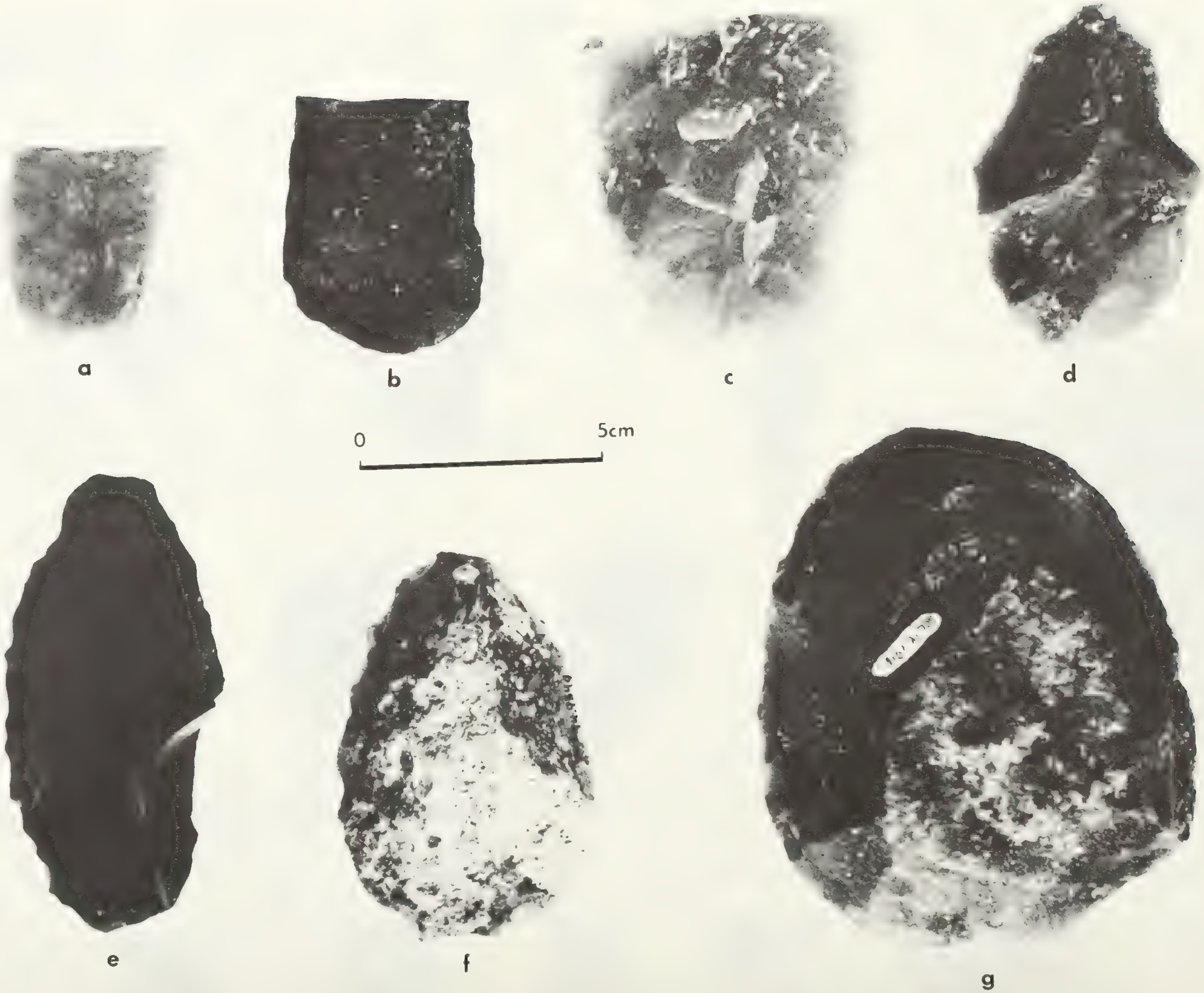


Figure 23. Example of flaked stone artifact assemblage from Component I, Taliaferro site. a-c, Large preform; d-e, Blank; f, Preblank; g, Modified cobble.

Large, side-notched projectile points are quite common in most artifact assemblages from Early Archaic sites or components in southwest Wyoming. Component II at the Maxon Ranch site, dating to 4860 and 4760 years ago, produced points identified as Bitterroot and Elko side-notched types (Harrell and McKern 1986). Other Early Archaic sites in southwest Wyoming with side-notched points include Component I at Sweetwater Creek (Newberry and Harrison 1986), 48SW4491 (Creasman et al. 1983), Deadman Wash (Armitage et al. 1982), 48UT370 (Schroedl 1985), and 48UT375 (Angulski 1982). Unlike Component I at the Taliaferro site, many of these sites also had large, corner-notched points.

Only one drill (SCL14.5179) was recovered from Component I deposits. It was originally a large, side-notched projectile point that was broken at the notches and resharpened into a drill. A similar side-notched drill was found in Component I, with an age of 5130 years ago, at the Sweetwater Creek site located on the Rock Springs Uplift in southwest Wyoming (Newberry and Harrison 1986). The two final biface tips belonging to Component I probably are proximal portions of projectile points.

Of the 21 recovered preforms, 13 were classified as large preforms, and the remaining 8 were fragments. Eleven of the large preforms are of quartzite, and two are of opaque algalitic chert. Component I produced more large preforms (31% of the total for the site) than the other components. This component also lacked small preforms. Fifteen of the 25 blanks belonging to Component I are of quartzite, but a majority of the preblanks are of translucent algalitic chert. Quartzite is the second most common material type of the preblanks. The other six bifaces were grouped as indeterminate. As detailed in Appendix B, an examination of changes through time in the size of the preforms, blanks, and preblanks has shown that they are significantly larger in the Early Archaic Component I when compared to later periods. There are significant differences in the material type of the blanks and preforms through time as well. For these artifact types, quartzite is the dominate material in Component I, and translucent algalitic chert is most common in the Late Prehistoric components. The majority of preblanks in all components, however, are of translucent algalitic chert.

Among the 16 retouched flakes, 5 are Type I distal retouched, 3 are Type II distal retouched, and 1 is a Type III distal retouched. The Type I distal retouched flakes, commonly referred to as "hafted end scrapers," (Figure 22e) are unique to the Early Archaic Component I at the Taliaferro site. One was found in Component II, dating from 4860 to 4760 years ago, at the Maxon Ranch site in southwest Wyoming (Harrell and McKern 1986). This artifact type may be a temporal marker for the Early Archaic in the area. The three Type II distal retouched flakes are similar in size to Type I, but without obvious notches. The one Type III distal retouched flake is much larger than the others and, in addition to the distal end, displays retouch for backing along one lateral edge. The implements with the steeper edge angles (about 80°) were probably resharpened until spent and then discarded.

Three flakes were classified as lateral retouched: two were included as Type I and one as Type II. The Type I flakes have a straight margin along the working edge, and the Type II flake has a curved margin. The notched flake contains a small notch created by unifacial retouch on the lateral edge. The graver has retouch along the proximal end of the flake, which forms a projection. Two irregular retouched flakes also were recovered from Component I.

The seven utilized flakes are of quartzite and translucent and opaque algalitic cherts. Four artifacts from Component I represent the expedient modification of cobbles and pebbles. These modified quartzite cobbles and pebbles exhibit bifacial flaking along one or more edges, and in contrast to artifacts in the bifacial reduction sequence, flake scars extend less than halfway across the artifact face. One modified cobble (SCL14.4911) has flaking around the entire margin. Twelve cores were recovered from Component I. Eleven are multidirectional, and one is residual. Component I has a slightly higher percentage of cores than the other components.

Artifacts (including preforms, blanks, and preblanks) representing the entire bifacial reduction sequence of tool manufacture are present in the collection from Component I. Many are incomplete and probably were broken during production. Figure 24 illustrates the horizontal distribution of the two broken artifacts that were refitted. The other two reduction sequences identified at the site, the retouching or use of flakes and the expedient modification of cobbles or pebbles, are evident in the flaked stone artifact assemblage from Component I as well. Overall, the complete range of flaked stone reduction activities occurred at the site during Component I times. The dominant material type used in this manufacturing was quartzite.

A crosstabulation of the 11,478 pieces of debitage recovered from Component I is provided in Table 4. As with the tools, quartzite dominates the debitage collection, indicating that these flakes resulted from the production of the recovered stone tools. Interestingly, the second most common artifact material is translucent algalitic chert, and for the debitage, it is opaque algalitic chert. The majority of the translucent

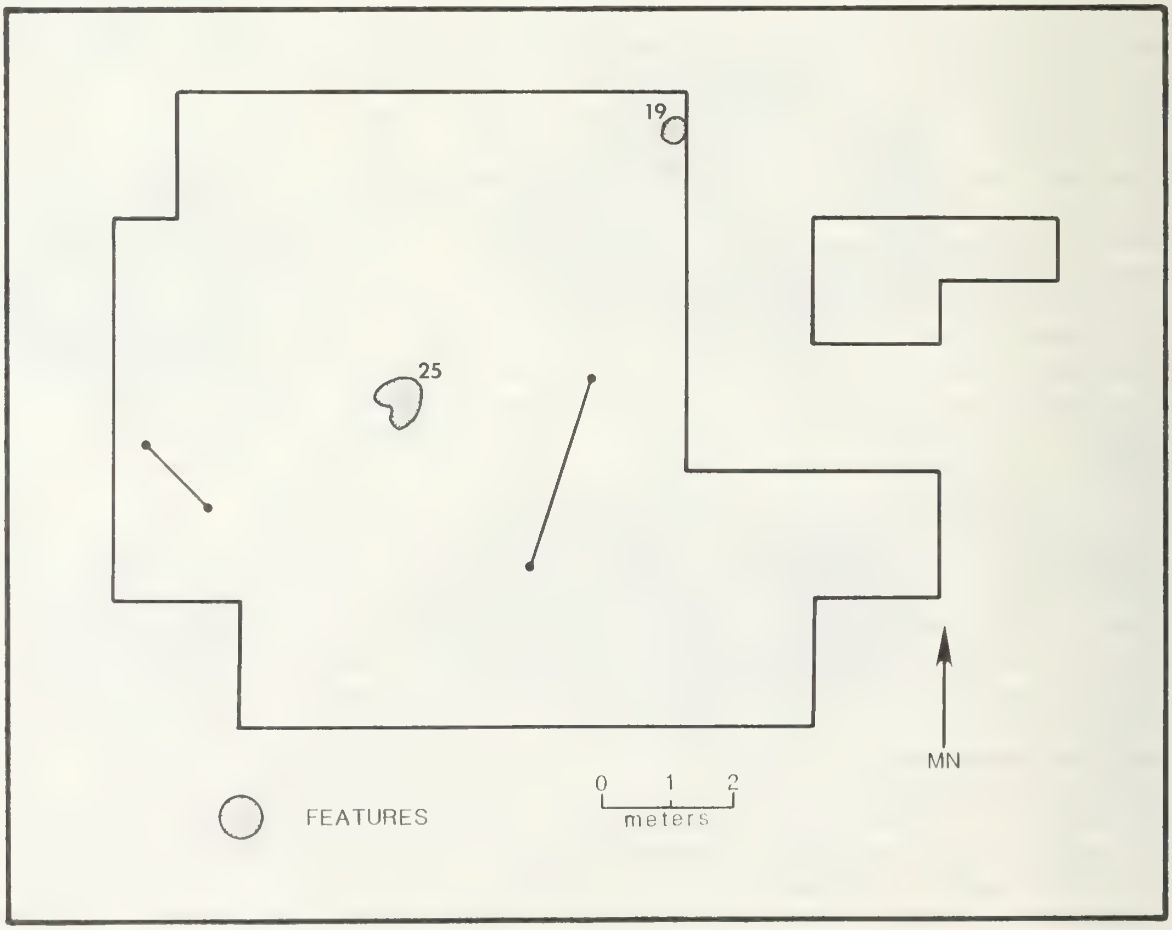


Figure 24. Plan map of the north half of Excavation Area A showing the horizontal distribution of the two artifacts that were refitted, Component I, Taliaferro site.

Table 4. Crosstabulation of debitage type by material type, Component I, Taliaferro site.

Debitage Type		Material Type: Translucent Chert	Opaque Chert	Quartzite	Whiskey Buttes Chert	Obsidian	Other	Total
Primary	#	67	743	737	93	2	20	1662
	Row %	4.03	44.71	44.34	5.60	0.12	1.20	14.48
	Column %	11.09	20.20	11.83	11.15	10.53	18.02	
	Total %	0.58	6.47	6.42	0.81	0.02	0.17	
Secondary	#	156	908	899	185	5	30	2183
	Row %	7.15	41.59	41.18	8.47	0.23	1.37	19.02
	Column %	25.83	24.68	14.43	22.18	26.32	27.03	
	Total %	1.36	7.91	7.83	1.61	0.04	0.26	
Tertiary	#	351	1888	4380	516	9	51	7195
	Row %	4.88	26.24	60.88	7.17	0.13	0.71	62.69
	Column %	58.11	51.32	70.29	61.87	47.37	45.95	
	Total %	3.06	16.45	38.16	4.50	0.08	0.44	
Bifacial Thinning	#	18	28	12	9	2	2	71
	Row %	25.35	39.44	16.90	12.68	2.82	2.82	0.62
	Column %	2.98	0.76	0.19	1.08	10.53	1.80	
	Total %	0.16	0.24	0.10	0.08	0.02	0.02	
Shatter	#	11	98	194	28	1	4	336
	Row %	3.27	29.17	57.74	8.33	0.30	1.19	2.93
	Column %	1.82	2.66	3.11	3.36	5.26	3.60	
	Total %	0.10	0.85	1.69	0.24	0.01	0.03	
Tested Material	#	1	14	9	3	0	4	31
	Row %	3.23	45.16	29.03	9.68	0.00	12.90	0.27
	Column %	0.17	0.38	0.14	0.36	0.00	3.60	
	Total #	0.01	0.12	0.08	0.03	0.00	0.03	
Total	#	604	3679	6231	834	19	111	11478
	%	5.26	32.05	54.29	7.27	0.17	0.97	100.00

chert artifacts, however, are preblanks, which probably were rejected with only minor reduction.

The majority of the debitage (62.6%) consists of tertiary flakes with minor percentages of secondary (19.0%) and primary (14.4%). As shown in Appendix B, these percentages correspond to the ratio of flake types expected at a site if all steps in the bifacial reduction sequence were preformed. Because only a limited amount of cortex occurs on a cobble, most flakes resulting from tool manufacture would be classified as tertiary. The percentages of flake type broken down for each material type are similar. The differences may be the result of the size and shape of the original material.

Other Artifacts

Three hammerstones and two pieces of groundstone were recovered from Component I deposits (see Appendix B). The hammerstones are of quartzite, with the largest measuring 119.4 x 87.2 x 38.4 mm. The smallest is 64.1 x 59.2 x 21.4 mm. The groundstone artifacts are both indeterminate fragments of sandstone. They are unifacially ground, and one also displays some pecking.

The Maxon Ranch (Harrell and Mckern 1986), Sweetwater Creek (Newberry and Harrison 1986), 48SW4491 (Creasman et al. 1983), and the Deadman Wash sites (Armitage et al. 1982) in southwest Wyoming have components of similar age that also contain groundstone. Component III at the Maxon Ranch site, with radiocarbon ages of 4860 and 4760 years B.P., produced two slab metates, three shaped manos, and one unshaped mano. An unidentified groundstone fragment was part of the artifact assemblage from the 5130-year-old Component I at the Sweetwater Creek site. Site 48SW4491, dating to 5520 years ago, produced three manos, three metates, and four groundstone fragments. The Early Archaic Components 3 and 4 at the Deadman Wash site had several pieces of groundstone. Though plant macrofossil evidence is rather limited for the Early Archaic period, the presence of groundstone at several sites dating to this period suggests some grinding of plant foods. Since the number of charred seeds is limited, roots and tubers may have been the food processed.

Plant Macrofossils

The fill from the two pit features, Features 19 and 25, was floated and examined for plant macrofossils (Appendix C). Only one charred sedge (Carex sp.) seed was recovered from Feature 25; Feature 19 lacked charred seeds. The sedge seed may be from Nebraska sedge (C. nebraskensis), a species observed in the riparian community along Slate Creek in the vicinity of the Taliaferro site. It flowers from May to August.

The paucity of charred seeds in the Early Archaic Component I is consistent with the results of other plant macrofossil analyses from sites in southwest Wyoming of similar age. Of the examined sites dating to this period, an occupation layer with an age of about 5000 years B.P. at 48CR2200 yielded four Chenopodium seeds, and a 5520-year-old component at 48SW4491 produced a Gramineae and Chenopodium seed (Creasman et al. 1983). Features at the Maxon Ranch site with occupations dating to about 6000 and 4800 years ago contained chokecherry (Prunus virginiana) seed fragments but lacked seeds from weedy species such as Chenopodium (Smith 1986c). Though the sample of Early Archaic period features with plant macrofossils will most likely increase with further research, it appears that in southwest Wyoming the collection and processing of seeds from weedy species was an activity of lesser importance during this period when compared to the Late Prehistoric period.

Pollen

A sample from the fill from each of the two features, Features 19 and 25, was processed and counted for pollen (Appendix D). Additionally, a control sample was taken from an unmodified rock found about 2 m south of Feature 19. As with the plant macrofossil analysis, the pollen frequencies from the two features produced only meager evidence of plant use at the site during Component I times. The presence of pricklypear (Opuntia sp.) pollen in the two features but not in the control sample suggests that this plant was processed. Pricklypear pollen also is absent from the stratigraphic column samples belonging to this component. The higher frequencies of sagebrush (Artemisia sp.) pollen in Feature 19 compared to Feature 25 and the control sample may reflect that sagebrush was burned in the feature. Sagebrush is a common shrub in the Green River Basin and was important for fuel in treeless areas during ethnographic times. Another plant that possibly was used in or near the features was willow (Salix sp.). Again, willow pollen occurs in both features but is absent in the control sample and in the stratigraphic column samples. Willows may have grown in the riparian community along Slate Creek during prehistoric times. The other pollen frequencies and types recorded from the Component I samples lack evidence indicative of the use of plants by the prehistoric inhabitants.

Though two indeterminate fragments of groundstone were recovered from Component I deposits, the processing and use of plants appears to be a minor activity during the Early Archaic period at the site. Sedge (Carex sp.) seeds, as evidenced by a single seed from Feature 25, may have been gathered, and pricklypear fruits or stems possibly were prepared in the vicinity of the features. Other information concerning food plants is lacking for this component.

Animal Remains

The only bone recovered from Component I is a wall fragment of a large mammal (Appendix E). This piece is completely calcined. The paucity of bone from the 102 m² excavation block suggests that animal processing was an unimportant activity at the site during Component I times. Though the Taliaferro site lacks significant amounts of bone, other excavated sites dating to this period contain some bone. In the Red Desert, 48SW4491, dating to 5520 years ago, yielded remains of jackrabbit (Lepus sp.) and unidentifiable large and medium mammals; and 48SW1900, with an age of 5510 years B.P., produced pronghorn (Antilocarpa americana) and cottontail (Sylvilagus sp.) bone (Creasman et al. 1983). Pronghorn, mule deer (Odocoileus hemionus), jackrabbit, and cottontail bone was recovered from Component II (4760 years B.P.) at the Maxon Ranch site. This component contained more pieces of bone than any other component at the Maxon Ranch site (Harrell and McKern 1986).

Spatial Distribution of Remains

The spatial distribution of features, fire-cracked rock, flaked stone artifacts, groundstone, and debitage was plotted for Component I. The relationships of these remains provide some clues about the type and location of the activities conducted at the site. A further discussion on the interpretations concerning the spatial relationships of the past activities represented in Component I will be detailed in Chapter 5.

Figure 25 shows the two features and the distribution of the fire-cracked rocks. Feature 25 occurs in the center of the excavation block and is surrounded by a scattering of fire-cracked rock. The other feature, Feature 19, is in the northeast corner associated with only a few rocks. Several irregular-shaped areas of dark-stained sediment are situated between the two features and may represent deflated fire hearths. Additional fire-cracked rocks are scattered throughout the western and northern portions of the excavation area.

The distribution of the flaked stone artifacts and groundstone is provided in Figure 26. The density values by square meter for all flaked stone artifacts across the excavation area were smoothed using trend surface analysis (Hodder and Orton 1976:155). A generalized map showing differential spatial trends of the artifacts is produced with this technique. The major density peak of all flaked stone artifacts is located in the east-central portion of the excavation area. This peak is situated near the irregular-shaped stained areas just to the east of Feature 25 and south of Feature 19. Other dense areas occur along the southern edge and in the southwest corner of the excavation area.

Individual maps were made of the distribution of projectile points, bifaces, retouched and utilized flakes, cores, and groundstone. Due to the

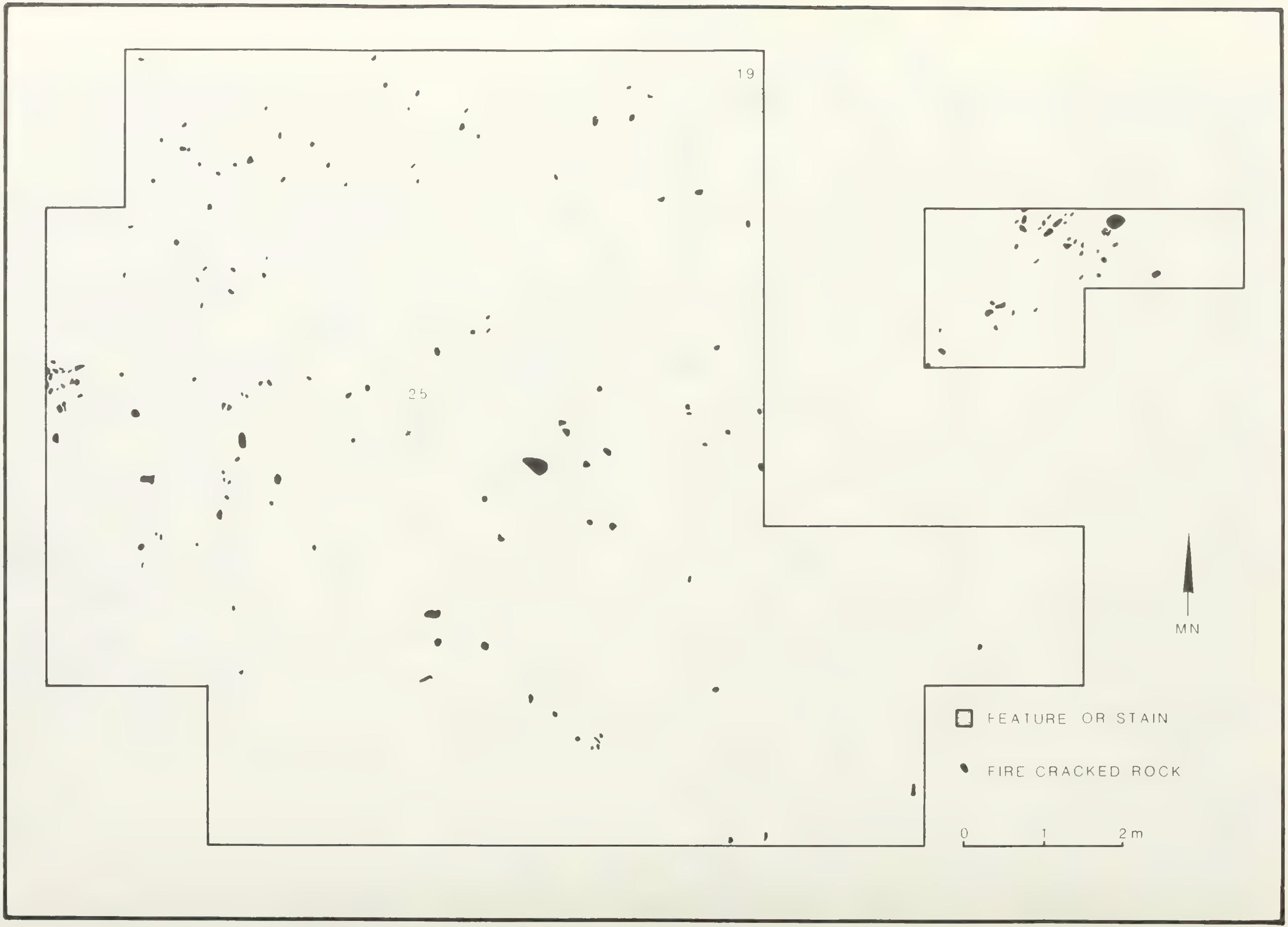


Figure 25. Plan map of the north half of Excavation Area A showing distribution of features and fire-cracked rock, Component I, Taliaferro site.

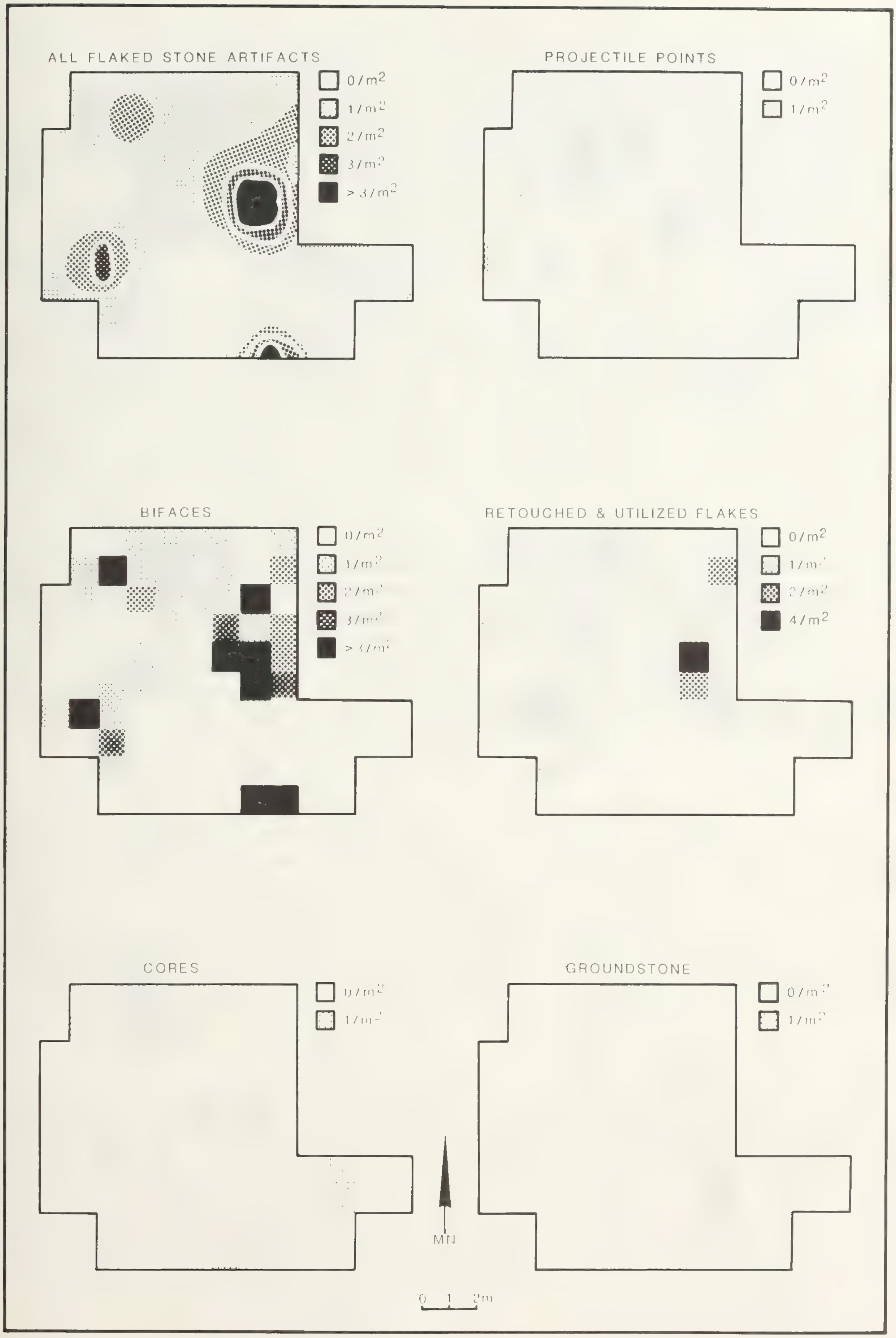


Figure 26. Plan maps of the north half of Excavation Area A showing the horizontal distribution of all flaked stone and groundstone tools, Component I, Taliaferro site.

small number of each of these artifact types, separate trend surface maps were not possible. Instead, maps were made showing the number of each artifact type per square meter.

The projectile points tend to be scattered around Feature 25 in the center of the excavation area and have a different spatial distribution from all flaked stone artifacts. Because most recovered artifacts were preblanks, blanks, or preforms, the number of bifaces per square meter is similar to the pattern in the trend surface map for all flaked stone artifacts. The retouched and utilized flakes and cores are scattered throughout the excavation area. The two pieces of groundstone occur in the southeastern portion. Overall, the various artifact types lack distinct distributions.

Figure 27 provides trend surface density maps for total debitage and individual maps for the various material types. Three density peaks are present on the map for total debitage; the two larger ones are located in the northwest and east-central portions of the excavation area, and the third and smaller one is in the southwest corner. The areas with the most debitage tend to surround the two features. The peak situated in the east-central portion of the excavation area corresponds to the most dense area for all flaked stone artifacts.

The individual trend surface maps for the various material types indicate some differences in their spatial distribution, though most roughly follow the general pattern for total debitage. The small quantities of translucent algalitic chert are concentrated in the northwestern and southern portions of the excavation area. The pattern for the debitage densities of opaque algalitic chert and quartzite corresponds to the one for the total. Most of the Whiskey Buttes chert was recovered from the northwestern corner, and the few pieces of debitage of other material types were concentrated in the east-central portion of the excavation area.

Component II

The Middle Archaic Component II consists of the eroded fire-cracked rock layer in the northern portion of the north half of Excavation Area A. It is the most disturbed component at the site, and the two associated pit features lacked sufficient charcoal for radiocarbon estimates. Using stratigraphic relationships, the component dates between 5290 years B.P. (the age of Component I) and 2850 years ago (the earliest of the three radiocarbon estimates for Component III). Some material from later occupations is mixed with that from Component II. A total of 58 m^2 of excavated area was assigned to this component.

Features

Two medium basins, Features 13 and 21, are assigned to Component II (Table 5). They occurred slightly below the fire-cracked rock layer in the least eroded area of the component and were horizontally about 3 m apart. These basin-shaped pits were relatively deep compared to surface area, and their surface area to volume ratios fall between those of the small and large basins (Appendix A). Both contained dark-stained sediment, debitage, and only a few small charcoal flecks. Neither produced fire-cracked rocks, bone, charred plant macrofossils, and flaked stone artifacts; however, both appeared to be fairly intact and with little deflation. Figure 28 shows Feature 13 after excavation.

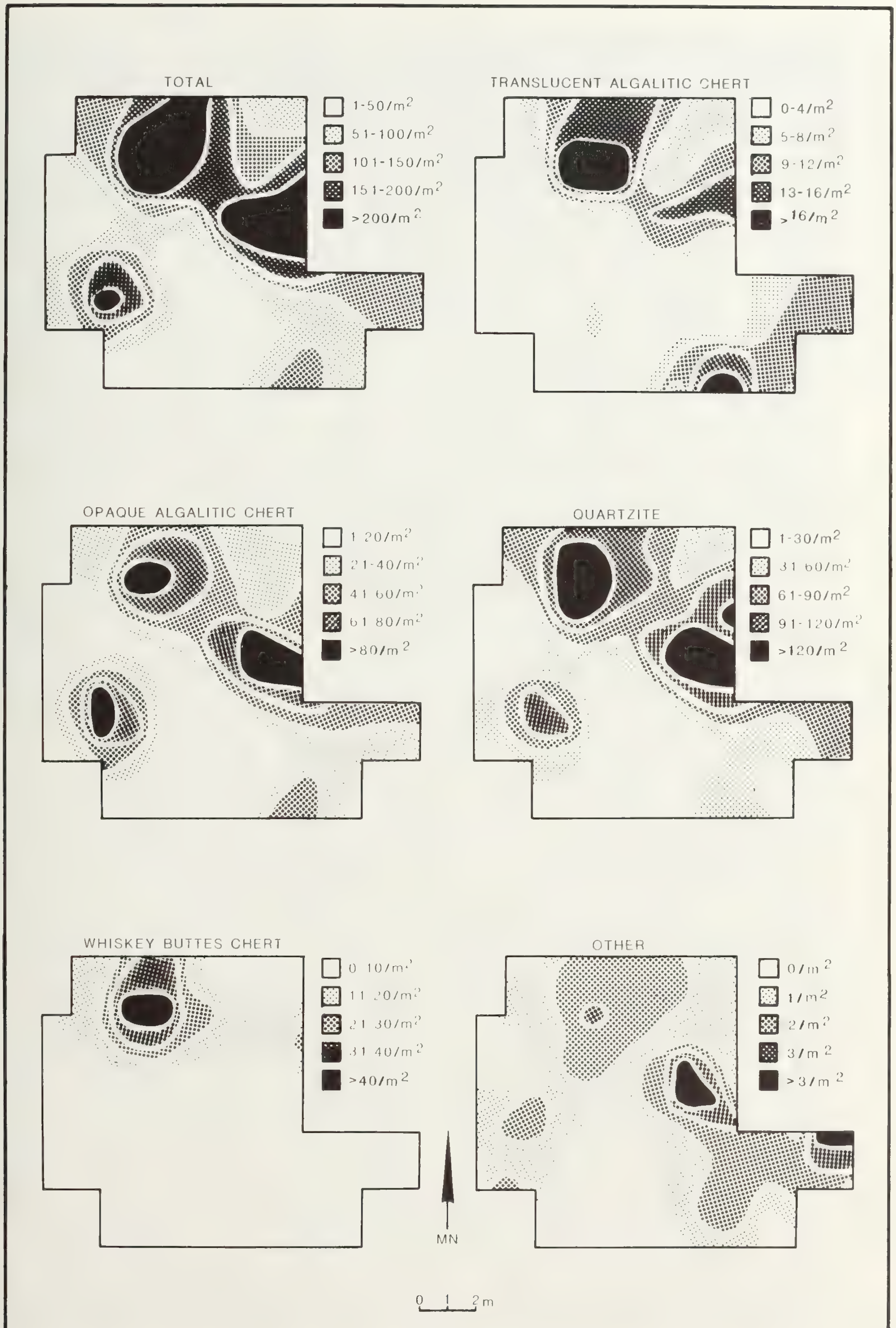


Figure 27. Plan maps of the north half of Excavation Area A showing the horizontal distribution of total debitage and material types, Component I, Taliaferro site.

Table 5. Characteristics of pit features, Component II, Taliaferro site.

Feature No.	Type	Volume (liters)	Area (cm^2)	Artifacts	Debitage (total)	Bone No.	Bone wt.(g)	Plant Macro-fossils[a]	Charcoal[b]
13	Medium Basin	31.0	1963.0	-	24	-	-	0	little
21	Medium Basin	34.0	2123.0	-	13	-	-	0	little

[a]Number of taxa

[b]Relative amount

The paucity of charcoal and the absence of such remains as bone and fire-cracked rock in the fill of the fairly intact medium basins suggests that their function was something other than fire or cooking hearths. Hearths would most likely contain charcoal (indicating fire), bone from a meal, or fire-cracked rock from cooking activities. These two features may have served as pits where some kind of organic materials were stored and later decayed, but the meager evidence precludes any definite conclusions concerning their function. Due to the eroded nature of Component II, comparisons of the spatial relationships of the various remains around the features are not possible.

Flaked Stone Artifacts

Sixty-five flaked stone artifacts and 8,024 pieces of debitage were recovered from Component II deposits. They are 6 projectile points and fragments, 18 preforms or fragments, 8 blanks, 10 preblanks, 7 indeterminate bifaces, 4 retouched flakes, 7 utilized flakes, 2 modified cobbles, and 3 cores (Table 6). Figure 29 illustrates an example of the flaked stone artifact types from Component II.

The projectile points belonging to Component II were identified as Type II large, side-notched, Types I and II lanceolate, Type I bifurcate-stemmed, and miscellaneous fragments. Type II large, side-notched points also were recovered from Component I and III at the Taliaferro site and appear to span the entire Archaic period from 5600 to 1900 years ago. They are similar to those referred to as Elko Side-notched points in the archaeological literature of the Great Basin (Heizer et al. 1968). In the eastern Great Basin and northern Colorado Plateau, Elko Side-notched points have a long time span dating between 6000 and 3200 years ago B.P. (Holmer 1986).

In addition to the two Type I lanceolate points from the Middle Archaic Component II, two others were recovered from Late Prehistoric components; however, they are probably out of place and are the result of redeposition. These points resemble the McKean Lanceolate type of the Northwestern Plains (Mulloy 1954; Wheeler 1952). Points of this type are part of the McKean Complex assemblage and are found at sites throughout the Northwestern Plains dating between 5000 and 3000 years ago (Frison 1978). They have also been identified at Sudden Shelter with an age from 4600 to 3500 years (Holmer 1978).

Figure 28. Feature 13, a medium basin, after excavation, Component II, Taliaferro site. Small squares on scale equals one centimeter.

Table 6. Crosstabulation of flaked stone artifact type by material type, Component II, Taliaferro site.

Artifact Type		Material Type: Translucent Chert	Opaque Chert	Quartzite	Moss Agate	Whiskey Buttes Chert	Obsidian	Total
Large, Side-notched Point, Type II	#	1	0	0	0	0	0	1
	Row %	100.0	0	0	0	0	0	1.5
	Column %	5.0	0	0	0	0	0	
	Total %	1.5	0	0	0	0	0	
Large, Lanceolate Point, Type I	#	2	0	0	0	0	0	2
	Row %	100.0	0	0	0	0	0	3.1
	Column %	10.0	0	0	0	0	0	
	Total %	3.1	0	0	0	0	0	
Large, Lanceolate Point, Type II	#	1	0	0	0	0	0	1
	Row %	100.0	0	0	0	0	0	1.5
	Column %	5.0	0	0	0	0	0	
	Total %	1.5	0	0	0	0	0	
Large, Bifurcate-Stemmed Point, Type I	#	0	0	1	0	0	0	1
	Row %	0	0	100.0	0	0	0	1.5
	Column %	0	0	4.8	0	0	0	
	Total %	0	0	1.5	0	0	0	
Misc. Large Point Fragment	#	0	0	1	0	0	0	1
	Row %	0	0	100.0	0	0	0	1.5
	Column %	0	0	4.8	0	0	0	
	Total %	0	0	1.5	0	0	0	
Large Preform	#	0	2	6	0	0	0	8
	Row %	0	25.0	75.0	0	0	0	12.3
	Column %	0	12.5	28.6	0	0	0	
	Total %	0	3.1	9.2	0	0	0	
Small Preform, Type I	#	1	0	0	0	0	0	1
	Row %	100.0	0	0	0	0	0	1.5
	Column %	5.0	0	0	0	0	0	
	Total %	1.5	0	0	0	0	0	
Preform Fragment	#	3	3	1	1	0	1	9
	Row %	33.3	33.3	11.1	11.1	0	11.1	13.8
	Column %	15.0	18.8	4.8	100.0	0	100.0	
	Total %	4.6	4.6	1.5	1.5	0	1.5	
Blank	#	4	2	1	0	1	0	8
	Row %	50.0	25.0	12.5	0	12.5	0	12.3
	Column %	20.0	12.5	4.8	0	16.7	0	
	Total %	6.2	3.1	1.5	0	1.5	0	
Preblank	#	2	4	3	0	1	0	10
	Row %	20.0	40.0	30.0	0	10.0	0	15.4
	Column %	10.0	25.0	14.3	0	16.7	0	
	Total %	3.1	6.2	4.6	0	1.5	0	
Indeterminate Biface	#	4	2	0	0	1	0	7
	Row %	57.1	28.6	0	0	14.3	0	10.8
	Column %	20.0	12.5	0	0	16.7	0	
	Total %	6.2	3.1	0	0	1.5	0	

Table 6. Concluded.

Artifact Type		Material Type						
		Translucent Chert	Opaque Chert	Quartzite	Moss Agate	Whiskey Buttes Chert	Obsidian	Total
Distal Retouched Flake, Type III	#	0	0	1	0	0	0	1
	Row %	0	0	100.0	0	0	0	1.5
	Column %	0	0	4.8	0	0	0	
	Total %	0	0	1.5	0	0	0	
Lateral Retouched Flake, Type I	#	0	0	1	0	0	0	1
	Row %	0	0	100.0	0	0	0	1.5
	Column %	0	0	4.8	0	0	0	
	Total %	0	0	1.5	0	0	0	
Notched Flake	#	0	1	0	0	0	0	1
	Row %	0	100.0	0	0	0	0	1.5
	Column %	0	6.3	0	0	0	0	
	Total %	0	1.5	0	0	0	0	
Irregular Retouched Flake	#	0	0	0	0	1	0	1
	Row %	0	0	0	0	100.0	0	1.5
	Column %	0	0	0	0	16.7	0	
	Total %	0	0	0	0	1.5	0	
Utilized Flake	#	1	2	2	0	2	0	7
	Row %	14.3	28.6	28.6	0	28.6	0	10.8
	Column %	5.0	12.5	9.5	0	33.3	0	
	Total %	1.5	3.1	3.1	0	3.1	0	
Modified Pebble and Cobble	#	0	0	2	0	0	0	2
	Row %	0	0	100.2	0	0	0	3.1
	Column %	0	0	9.5	0	0	0	
	Total %	0	0	3.1	0	0	0	
Residual Core	#	1	0	0	0	0	0	1
	Row %	100.0	0	0	0	0	0	1.5
	Column %	5.0	0	0	0	0	0	
	Total %	1.5	0	0	0	0	0	
Multidirectional Core	#	0	0	2	0	0	0	2
	Row %	0	0	100.0	0	0	0	3.1
	Column %	0	0	9.5	0	0	0	
	Total %	0	0	3.1	0	0	0	
Total	#	20	16	21	1	6	1	65
	%	30.8	24.6	32.3	1.5	9.2	1.5	100.0

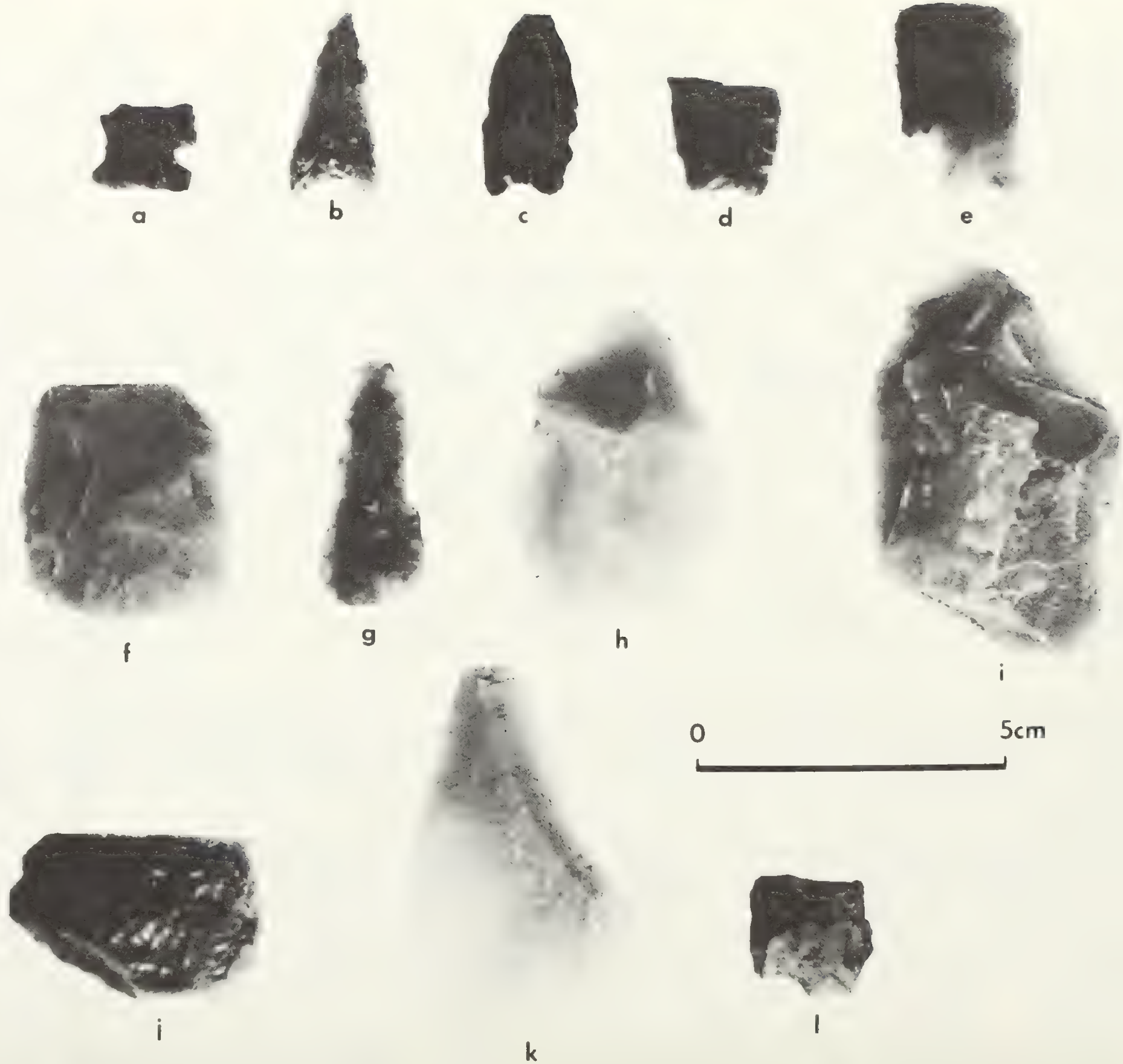


Figure 29. Example of flaked stone artifact assemblage from Component II, Taliaferro site. a, Large, side-notched projectile point, Type II; b-c, Large, lanceolate projectile point, Type I; d, Large, lanceolate projectile point, Type II; e, Large, bifurcate-stemmed projectile point, Type I; f, Large preform; g, small preform, Type I; h, Blank; i, Preblank; j, Distal retouched flake, Type III; k, Lateral retouched flake, Type I; l, Notched flake.

A single Type II lanceolate projectile point was associated with Component II. Three others were found in the Late Archaic Component III deposits. These points are similar to the Humboldt Concave Base from the Great Basin (Heizer and Clewlow 1968). They have a long temporal span from 7300 to 1300 years ago B.P. at Hogup Cave (Aikens 1970) and 6000 to 3100 years ago at sites in the western Great Basin (Heizer and Hester 1978). The ones recovered from the Taliaferro site fit into the latter portion of this wide time span.

Another projectile point from Component II was classified as Type I bifurcate-stemmed. Though the other two of this type were from Late Prehistoric components, they probably originated from Component II. Morphologically similar points are referred to as Pinto or Gatecliff Split Stem in the Great Basin literature and as Duncan in the Northwestern Plains (Amsden 1935; Thomas 1981; Wheeler 1954). The point from the Middle Archaic Component II dates between 5000 and 3000 years ago and has a similar age as the Duncan, Gatecliff Split Stem, and later Pinto types.

In southwest Wyoming, points similar to those belonging to Component II occur in Component I at the Cow Hollow Creek site (Schock et al. 1982) and Component VII at the Deadman Wash site (Armitage et al. 1982); however, Component VII Deadman Wash dates between 2870 to 2140 years ago, a more recent age for these points than at the Taliaferro site and sites in the surrounding regions. These points are also present in mixed assemblages at the Pine Springs site (Sharrock 1966) and are common in surface collections. In contrast, several Middle Archaic period sites in southwest Wyoming lack lanceolate and bifurcate-stemmed points and have only side-notched and corner-notched types. These sites include Components II and III at Sweetwater Creek (Newberry and Harrison 1986), Component I at 48SW1091 (O'Brien 1982), and Component II at 48CR2200 (Creasman et al. 1983).

Like the Early Archaic Component I, Component II is characterized by large preforms of quartzite and opaque algalitic chert. Eight of the nine identifiable preforms were classified as large preforms. The remaining one is a Type I small preform. Type I small preforms generally occur at the Taliaferro site in the later part of the Archaic period and the early portion of the Late Prehistoric. They are long and relatively narrow compared with the other preform types. The other nine preforms from Component II are fragments. The eight blanks and ten preblanks are about equally distributed between translucent and opaque algalitic chert and quartzite. This distribution of material types contrasts with that of Component I where most of the bifaces, except preblanks, are quartzite.

The four recovered retouched flakes from Component II are a Type III distal retouched, a Type I lateral retouched, a notched flake, and an irregular retouched flake. The Type III large, distal retouched flake is of quartzite, and similar ones are part of the artifact assemblages from most components. Type I lateral retouched flakes also are present throughout the prehistory of the Taliaferro site. Besides the one from Component II, a notched flake was recovered from Components I and VI. The seven utilized flakes are of quartzite, Whiskey Buttes chert, and translucent and opaque algalitic chert. Only two modified quartzite cobbles belong to Component II.

The recovery of formal tools, preforms, blanks, and preblanks indicates that the entire sequence of biface production occurred at the site during Component II times. Many of these artifacts, especially the preforms, are incomplete and probably were broken during manufacture. Figure 30 illustrates the horizontal distribution of the broken artifact that was refitted. Unlike the Early Archaic Component I, the retouching of flakes into implements and the expedient modification of cobbles or pebbles appear to have been only minor activities. Quartzite and translucent and opaque algalitic cherts were equally favored as a toolstone.

The crosstabulation of debitage type by material type is shown in Table 7. Quartzite is the dominant material type with 56.9% of the total, and opaque algalitic chert is the second most common type. The predominance of quartzite debitage contrasts with the frequency of material types for the recovered flaked stone tools for the component. Of the artifacts, quartzite is the dominant material for only the preforms. Additionally, 30.8% of the artifacts are of translucent algalitic chert and only 8.1% of the debitage is of that material. Because some of the artifacts, such as blanks and preblanks, were rejected in the early stages of reduction, only a few flakes from each were removed and incorporated into the archaeological record. The larger quartzite cobbles were more completely reduced, which resulted in more debitage per artifact.

The majority of the debitage consists of tertiary flakes with 56.5% of the total. Secondary flakes are represented by 25.7% and primary flakes by 14.7%. As shown in Appendix B, these percentages correspond to the expected ratio of flake types if all stages in the bifacial reduction sequence were performed at a site. However, the percentages of flake types broken down for translucent and opaque algalitic chert are quite different. There is a higher percentage of secondary flakes for these material types than would be expected

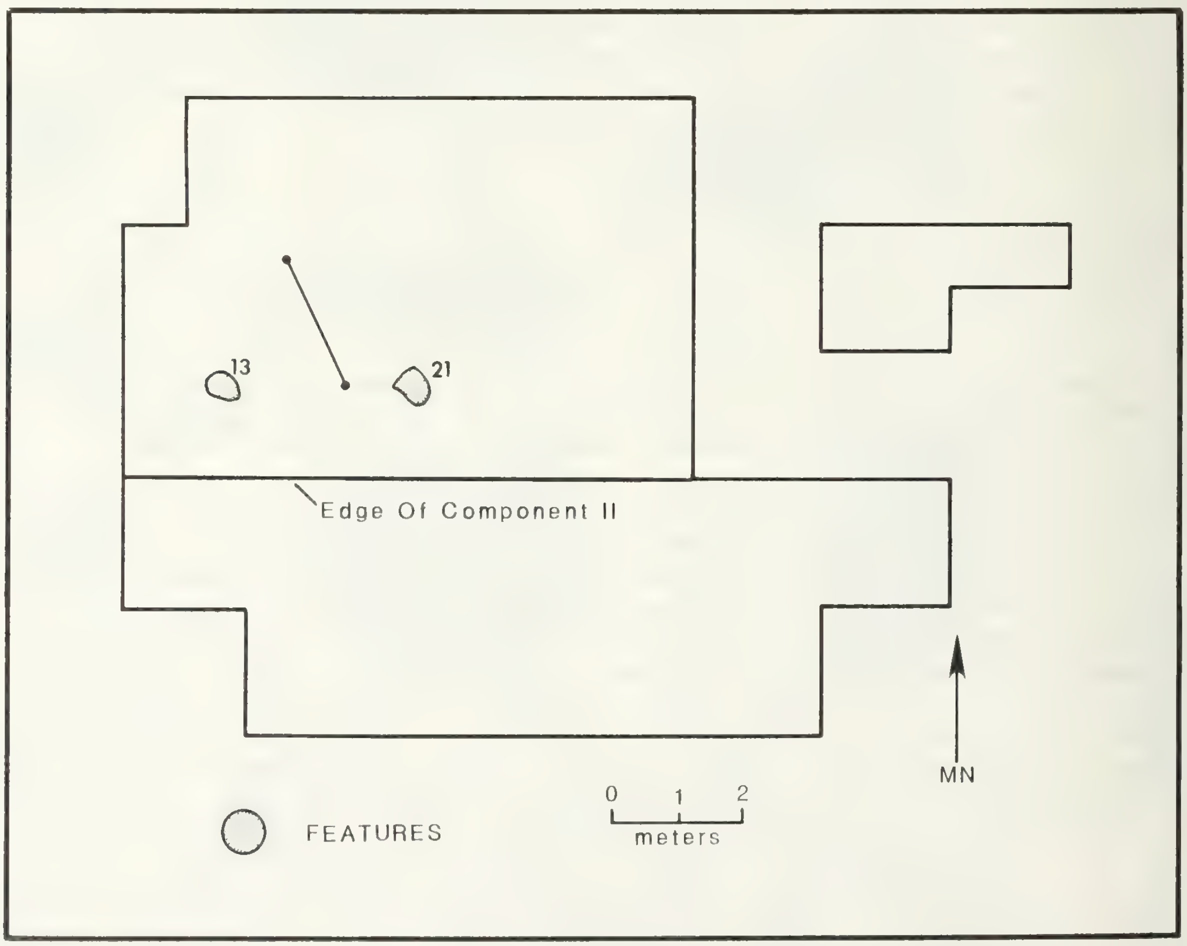


Figure 30. Plan map of the north half of Excavation Area A showing the horizontal distribution of the artifact that was refitted, Component II, Taliaferro site.

Table 7. Crosstabulation of debitage type by material type, Component II, Taliaferro site.

Debitage Type		Material Type: Translucent Chert	Opaque Chert	Quartzite	Whiskey Buttes Chert	Obsidian	Other	Total
Primary	#	95	476	520	79	3	9	1182
	Row %	8.04	40.27	43.99	6.68	0.25	0.76	14.73
	Column %	14.53	20.95	11.38	16.95	17.65	19.57	
	Total %	1.18	5.93	6.48	0.98	0.04	0.11	
Secondary	#	255	749	888	145	5	17	2059
	Row %	12.38	36.38	43.13	7.04	0.24	0.83	25.66
	Column %	38.99	32.97	19.44	31.12	29.41	36.96	
	Total %	3.18	9.33	11.07	1.81	0.06	0.21	
Tertiary	#	268	964	3056	222	4	20	4534
	Row %	5.91	21.26	67.40	4.90	0.09	0.44	56.51
	Column %	40.98	42.43	66.89	47.64	23.53	43.48	
	Total %	3.34	12.01	38.09	2.77	0.05	0.25	
Bifacial Thinning	#	31	26	11	5	3	0	76
	Row %	40.79	34.21	14.47	6.58	3.95	0.00	0.95
	Column %	4.74	1.14	0.24	1.07	17.65	0.00	
	Total %	0.39	0.32	0.14	0.06	0.04	0.00	
Shatter	#	3	47	92	14	0	0	156
	Row %	1.92	30.13	58.97	8.97	0.00	0.00	1.94
	Column %	0.46	2.07	2.01	3.00	0.00	0.00	
	Total %	0.04	0.59	1.15	0.17	0.00	0.00	
Tested Material	#	2	10	2	1	2	0	17
	Row %	11.76	58.82	11.76	5.88	11.76	0.00	0.21
	Column %	0.31	0.44	0.04	0.21	11.76	0.00	
	Total %	0.02	0.12	0.02	0.01	0.02	0.00	
Total	#	654	2272	4569	466	17	46	8024
	%	8.15	28.32	56.94	5.81	0.21	0.57	100.00

if bifaces were completely reduced. These results provide further evidence that translucent and opaque algalitic chert preblanks and blanks were rejected and only quartzite bifaces were reduced into preforms at the site. Many of the quartzite tools probably were removed from the area of production.

Other Artifacts

Only one hammerstone and a piece of groundstone were recovered from Component II deposits (Appendix B). The hammerstone is of quartzite and measures 62.8 x 45.9 x 24.3 mm. The groundstone fragment is a unifacially ground indeterminate fragment.

Though only one fragment belongs to Component II at the Taliaferro site, groundstone is common at sites dating to the Middle Archaic period in the region. The earliest slab metates and manos at Deluge Shelter are in Occupation Layer 12, with an age of 3680 years ago, and are associated with projectile points that resemble the Duncan type of the McKean Complex (Leach

1970). At the Pine Springs site, grinding implements first occur in Occupation Layer 2, dating to 3865 years ago, but this layer probably also has material from later periods (Sharrock 1966). Deadman Wash (Armitage et al. 1982), 48SW1091 (O'Brien 1982), and Sweetwater Creek (Newberry and Harrison 1986) are among the excavated sites in southwest Wyoming of the Middle Archaic period that contain groundstone. Because of the presence of milling stones at several sites dating to this period in the Northwestern Plains, the McKean Complex is often thought to represent a florescence of a plant food gathering adaptation (Frison 1978; Keyser 1986). In southwest Wyoming as with the Taliaferro site, however, there is a scarcity of charred plant macrofossils from sites of this period.

Plant Macrofossils

Fill from the two pit features, Features 13 and 21, was floated and examined for plant macrofossils (Appendix C); neither feature yielded charred seeds. The negative results for this component were probably due to prehistoric cultural activities rather than preservation because the features were still fairly intact as evidenced by the presence of some charcoal. The collection and processing of seeds probably was only a minor activity during this period. As with the Early Archaic Component I, the lack of seeds in this component is consistent with the results of other plant macrofossil analyses from sites in southwest Wyoming. Only one charred monolepis (Monolepis nuttalliana) seed was recovered from a feature at 48SW1091. This feature is dated at 3920 years ago (O'Brien et al. 1982).

Pollen

A sample from the fill from each of the two features, Features 13 and 21, was processed and counted for pollen (Appendix D). As with the plant macrofossil analysis, the pollen types and frequencies from the two medium basin-shaped pits lack information concerning the use of plants by the prehistoric inhabitants during Component II times. The pollen types and frequencies are similar to those of the natural pollen rain for this period, as indicated by the stratigraphic samples belonging to Component II. The two features failed to produce charred seeds as well; however, one indeterminate groundstone fragment was recovered. Apparently the gathering and processing of seeds or roots was, at the most, only a minor activity at the site during Component II times.

Animal Remains

Fifteen long bone shafts or bone wall fragments were recovered from Component II (Appendix E). These specimens include six large, three medium to large, five small to medium, and one small mammal fragment; none were identified to a specific taxon. One mussell shell fragment also was found. This small sample indicates that both large and small mammals were exploited during the Middle Archaic period, and the processing or disposal of the animal involved fragmentation of the bone. Additionally, the occupants of the site probably traveled at least 7 km to the Green River for mussels, which usually occur in the larger rivers. Freshwater mussels are accessible for collection between the spring and fall, suggesting an occupation for the site during these seasons.

Of the excavated Middle Archaic sites in southwest Wyoming, Component II at the Cow Hollow Creek site produced bone fragments of pronghorn or deer, cottontail, and unidentifiable large and medium mammals (Schock et al. 1982). Components II and III at the Sweetwater Creek site yielded only a few bone wall fragments of medium and small mammals (Newberry and Harrison 1986). The type and condition of the bone from these sites is similar to the results of the Taliaferro site. In contrast, more extensive animal exploitation during the Middle Archaic period is evident at the Scoggins site, a bison jump-trap on the extreme eastern side of the Red Desert (Lobdell 1973). The Scoggins site has a radiocarbon age estimate of 4540 years ago.

Spatial Distribution of Remains

The spatial distribution of the features, artifacts, and other remains for Component II was not plotted due to the eroded nature of the deposits. The relationships of the remains are more the result of erosion than past human activity. Distribution maps would be meaningless for understanding the location and type of activities.

Component III

The Late Archaic Component III covers most of the south half of Excavation Area A and the southern part of the north half. The portion in the north half is associated with the eroded fire-cracked rock layer and is about 10 to 20 cm below the present ground surface. In the south half of Excavation Area A, the material occurs as a fairly intact and discrete layer about 70 to 100 cm below the present ground surface. The radiocarbon age estimates for three of the Component III pit features are 2850, 2590, and 1910 years ago. The wide span of these dates indicates that the site probably was reused a number of times during this period though discrete incidences of use were undiscernible in the archaeological record. For this component, 116 m^2 was excavated in 1985. An additional 6 m^2 was dug during the 1984 testing.

Features

Six pit features were present in Component III (Table 8). These included a medium basin, Feature 20; three rock-filled basins, Features 28, 37, and 38; and two irregular-shaped pits, Features 35 and 36. A complete description of these morphological types and their functional interpretations are provided in Appendix A. The medium basin was the only feature from this component found in the north half of Excavation Area A and was associated with the eroded fire-cracked layer. It was similar in size and shape to the two medium basins belonging to Component II. As with the ones from Component II, Feature 20 contained a dark-stained sediment with only a few charcoal flecks and lacked fire-cracked rock, flaked stone artifacts, and bone; however, three charred goosefoot (Chenopodium sp.) seeds were recovered from the fill. The charcoal produced a radiocarbon age of 1910 years ago. Feature 20 may have functioned as a storage pit, but the meager evidence precludes any definite conclusions.

Two irregular-shaped pits, Features 35 and 36, were just above and to the side, as well as slightly overlapping, rock-filled basins. Feature 35 was associated with Feature 38, and Feature 36 was adjacent to Feature 37. Figure 31 illustrates an example of the relationship between these two feature types. Features 36 and 37 are shown after excavation in Figure 32. The bottoms of both irregular-shaped pits were oxidized, and the fill was a dark-stained sediment with some charcoal. Additionally, one irregular-shaped pit, Feature 36, produced 29 charred goosefoot (Chenopodium sp.) seeds. The two rock-filled basins, Features 37 and 38, contained a scattering of fire-cracked rock mixed with a dark-stained sediment and charcoal. Neither yielded charred plant macrofossils or flaked stone artifacts; however, seven burned, unidentifiable bone fragments were recovered from Feature 37. A radiocarbon age of 2850

Table 8. Characteristics of pit features, Component III, Taliaferro site.

Feature No.	Type	Volume (liters)	Area (cm^2)	Artifacts	Debitage (Total)	Bone No.	Bone wt. (g)	Plant Macro-fossil[a]	Charcoal[b]
20	Medium Basin	32.0	3739.0	-	44	-	-	1	little
28	Rock-Filled Basin	10.0	1486.0	-	2	-	-	2	little
35	Irregular-Shaped	2.0	1104.5	-	15	-	-	0	some
36	Irregular-Shaped	3.5	707.0	-	1	-	-	1	some
37	Rock-Filled Basin	14.0	1963.5	-	17	7	2.2	0	some
38	Rock-Filled Basin	8.0	1256.5	-	1	-	-	0	much

[a]Number of taxa

[b]Relative amount

years ago was obtained from charcoal belonging to Feature 38. This feature is pictured in Figure 33.

These two combinations of irregular basin and rock-filled basin features may have been used in a two-stage cooking activity. The oxidation and charcoal in the irregular-shaped pits indicate in-place burning. Charcoal created from these fires possibly was scraped into the adjacent basin for heating the rocks. The heated rocks could then be removed for use in cooking and bone grease production; or, the basin with the hot rocks and charcoal could have functioned as an oven for baking food plants such as roots or tubers.

The remaining rock-filled basin from Component III was Feature 28 (Figure 34). It was partly excavated and recorded as Feature 2 during the 1984 testing of the site (Hoefer et al. 1985). A sediment sample yielded a radiocarbon age of 2590 years ago. This feature was similar to the other two rock-filled basins from the component, but without an associated irregular-shaped pit. The fill consisted of dark-stained sediment with only a small amount of charcoal. One charred goosefoot (Chenopodium sp.) and one Cruciferae (Mustard family) seed were recovered during the plant macrofossil analysis. The feature probably had a function similar to the other two rock-filled basins.

In addition to pit features, two fire-cracked rock concentrations were present in Component III. Concentration C was adjacent to Feature 28, and Concentration E was next to Features 35 and 38. These piles of fire-cracked rocks probably resulted from activities associated with the rock-filled basins.

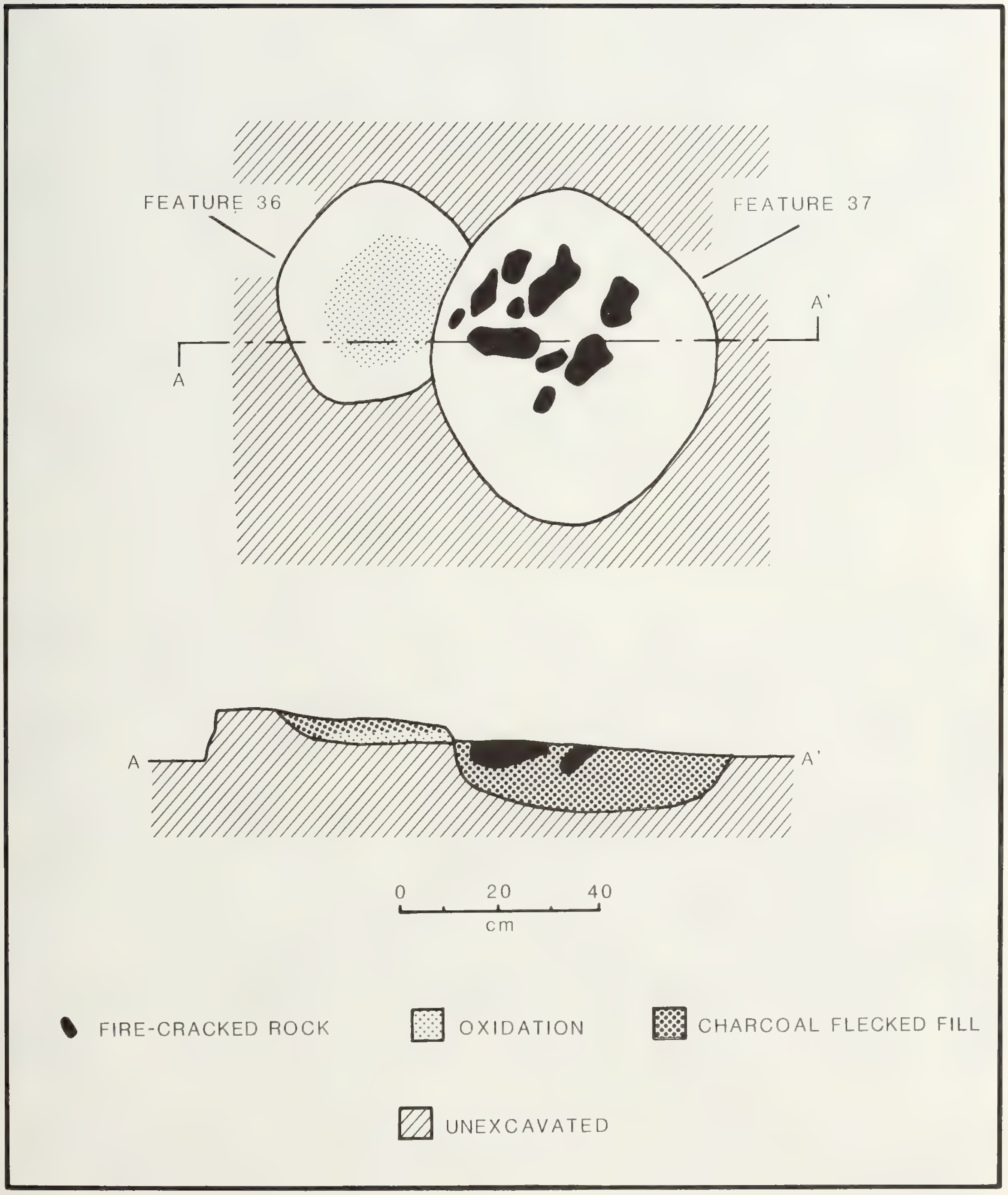


Figure 31. Plan view and cross section of Features 36 and 37 showing the relationship between an irregular-shaped pit and a rock-filled basin, Component III, Taliaferro site.

Figure 32. Features 36 and 37, an irregular-shaped pit and rock-filled basin, after excavation, Component III, Taliaferro site.

Figure 33. Feature 38, a rock-filled basin, after excavation, Component III, Taliaferro site.

Figure 34. Feature 28, a rock-filled basin, partly excavated, with associated fire-cracked rock, Component III, Taliaferro site. This feature is below the dark stained sediment evident in the profile.

Flaked Stone Artifacts

A total of 120 flaked stone artifacts and 7,881 pieces of debitage was recovered from Component III deposits. The artifacts are 15 projectile points and fragments, a drill, 7 final biface tips, 31 preforms or fragments, 19 blanks, 16 preblanks, 10 indeterminate bifaces, 6 retouched flakes, 6 utilized flakes, a modified cobble, and 6 cores (Table 9). Figure 35 illustrates an example of the flaked stone artifact types from Component III.

The projectile points belonging to Component III were classified as Types II and III large side-notched; Type II lanceolate; Type II bifurcate-stemmed; large, corner-notched; miscellaneous large point fragments; and small, corner-notched. Type II large, side-notched points also were recovered from Components I and II at the Taliaferro site and appear to span the entire Archaic period from 5200 to 1900 years ago. Except for the reworked specimen from the Late Prehistoric Component VI, the two Type III large, side-notched points from Component III are unique for the site. The points resemble the Avonlea type from the Northwestern Plains (Kehoe and McCorquodale 1961). On the Northwestern Plains, Avonlea points usually date between 1800 and 1400 years ago but are often associated with the earlier Pelican Lake Corner-notched type (Reeves 1983). The Type III side-notched points from the Taliaferro site occur slightly earlier and somewhat outside the range of the predominately Plains projectile point.

Three Type II lanceolate projectile points were associated with Component III; another was found in the Middle Archaic Component II deposits. These points appear to be the Humboldt Concave Base type common in the Great Basin (Heizer and Clewlow 1968). The ones recovered from the Taliaferro site correspond in age to the latter portion of their long time span in the Great Basin. The only two Type II bifurcate-stemmed points from the site belong to Component III. Morphologically these points resemble the Hanna type, which are part of the McKean Complex assemblage of the Middle Plains Archaic period (Frison 1978; Wheeler 1954). However, as at the Taliaferro site, Hanna points are found with the Pelican Lake Corner-notched type at several sites throughout the Great Plains including the Upper Level of the McKean site and the 3000- to 2700-year-old deposits at the Head-Smashed-In Buffalo Jump (Mulloy 1954; Reeves 1978). This indicates that Hanna points may be slightly later in time than the other McKean Complex types and may extend into the Late Archaic period.

Five of the six large, corner-notched points from the Taliaferro site were found in Component III. The remaining one is from the Late Prehistoric Component VII and is probably out of place. Large, corner-notched points usually are assigned to the Pelican Lake type on the Northwestern Plains and to the Elko Series in the Great Basin (Heizer and Baumhoff 1961; Wettlaufer 1955). The large, corner-notched points from the Taliaferro site date between 2800 and 1900 years ago, which corresponds to the chronological placement of the Pelican Lake type on the Northwestern Plains as well as in part to the Elko Series in the western Great Basin. Two large point fragments from Component III were too fragmentary for classification.

In addition to the large projectile points, two small, corner-notched points were associated with Component III. Most likely, the small arrow points belong to the Late Prehistoric period. Components dating to the Late Prehistoric at the Taliaferro site produced 70 of these small points. In the Great Basin and northern Colorado Plateau, small, corner-notched points usually are called Rose Spring, Eastgate, or Rosegate (Heizer and Baumhoff 1961; Lanning 1963; Thomas 1981). Throughout the region, these points

Table 9. Crosstabulation of flake stone artifact type by material type, Component III, Taliaferro site.

Artifact Type		Material Type: Trans-lucent Chert	Opaque Chert	Quartzite	Moss Agate	Whiskey Buttes Cherts	Total
Large, Side-Notched Point, Type II	#	0	0	1	0	0	1
	Row %	0	0	100.0	0	0	0.8
	Column %	0	0	3.3	0	0	
	Total %	0	0	0.8	0	0	
Large, Side-Notched Point, Type III	#	1	1	0	0	0	2
	Row %	50.0	50.0	0	0	0	1.7
	Column %	2.2	2.5	0	0	0	
	Total %	0.8	0.8	0	0	0	
Large, Lanceolate Point, Type II	#	0	3	0	0	0	3
	Row %	0	100.0	0	0	0	2.5
	Column %	0	7.5	0	0	0	
	Total %	0	2.5	0	0	0	
Large, Bifurcate-Stemmed Point, Type II	#	1	1	0	0	0	2
	Row %	50.0	50.0	0	0	0	1.7
	Column %	2.2	2.5	0	0	0	
	Total %	0.8	0.8	0	0	0	
Large, Corner-Notched Point	#	2	1	1	1	0	5
	Row %	40.0	20.0	20.0	20.0	0	4.2
	Column %	4.3	2.5	3.3	100.0	0	
	Total %	1.7	0.8	0.8	0.8	0	
Misc. Large Point Fragment	#	1	0	1	0	0	2
	Row %	50.0	0	50.0	0	0	1.7
	Column %	2.2	0	3.3	0	0	
	Total %	0.8	0	0.8	0	0	
Small, Corner-Notched Point	#	1	1	0	0	0	2
	Row %	50.0	50.0	0	0	0	1.7
	Column %	2.2	2.5	0	0	0	
	Total %	0.8	0.8	0	0	0	
Drill	#	1	0	0	0	0	1
	Row %	100.0	0	0	0	0	0.8
	Column %	2.2	0	0	0	0	
	Total %	0.8	0	0	0	0	
Final Biface Tip	#	4	2	1	0	0	7
	Row %	57.1	28.6	14.3	0	0	5.8
	Column %	8.7	5.0	3.3	0	0	
	Total %	3.3	1.7	0.8	0	0	
Large Preform	#	0	1	5	0	0	6
	Row %	0	16.7	83.3	0	0	5.0
	Column %	0	2.5	16.7	0	0	
	Total %	0	0.8	4.2	0	0	
Small Preform, Type I	#	1	0	0	0	0	1
	Row %	100.0	0	0	0	0	0.8
	Column %	2.2	0	0	0	0	
	Total %	0.8	0	0	0	0	
Small Preform, Type IIa	#	1	0	0	0	0	1
	Row %	100.0	0	0	0	0	0.8
	Column %	2.2	0	0	0	0	
	Total %	0.8	0	0	0	0	

Table 9. Concluded.

Artifact Type		Material Type					
		Translucent Chert	Opaque Chert	Quartzite	Moss Agate	Whiskey Buttes Cherts	Total
Small Preform, Type IIb	#	1	0	0	0	0	1
	Row %	100.0	0	0	0	0	0.8
	Column %	2.2	0	0	0	0	
	Total %	0.8	0	0	0	0	
Preform Fragment	#	6	12	2	0	2	22
	Row %	27.3	54.5	9.1	0	9.1	18.3
	Column %	13.0	30.0	6.7	0	66.7	
	Total %	5.0	10.0	1.7	0	1.7	
Blank	#	6	10	3	0	0	19
	Row %	31.6	52.6	15.8	0	0	15.8
	Column %	13.0	25.0	10.0	0	0	
	Total %	5.0	8.3	2.5	0	0	
Preblank	#	8	3	5	0	0	16
	Row %	50.0	18.8	31.3	0	0	13.3
	Column %	17.4	7.5	16.7	0	0	
	Total %	6.7	2.5	4.2	0	0	
Indeterminate Biface	#	6	2	2	0	0	10
	Row %	60.0	20.0	20.0	0	0	8.3
	Column %	13.0	5.0	6.7	0	0	
	Total %	5.0	1.7	1.7	0	0	
Distal Retouched Flake, Type III	#	0	0	1	0	0	1
	Row %	0	0	100.0	0	0	0.8
	Column %	0	0	3.3	0	0	
	Total %	0	0	0.8	0	0	
Lateral Retouched Flake, Type I	#	1	1	0	0	0	2
	Row %	50.0	50.0	0	0	0	1.7
	Column %	2.2	2.5	0	0	0	
	Total %	0.8	0.8	0	0	0	
Irregular Retouched Flake	#	0	1	2	0	0	3
	Row %	0	33.3	66.7	0	0	2.5
	Column %	0	2.5	6.7	0	0	
	Total %	0	0.8	1.7	0	0	
Utilized Flake	#	2	1	2	0	1	6
	Row %	33.3	16.7	33.3	0	16.7	5.0
	Column %	4.3	2.5	6.7	0	33.3	
	Total %	1.7	0.8	1.7	0	0.8	
Modified Cobble	#	0	0	1	0	0	1
	Row %	0	0	100.0	0	0	0.8
	Column %	0	0	3.3	0	0	
	Total %	0	0	0.8	0	0	
Residual Core	#	1	0	0	0	0	1
	Row %	100.0	0	0	0	0	0.8
	Column %	2.2	0	0	0	0	
	Total %	0.8	0	0	0	0	
Multidirectional Core	#	2	0	3	0	0	5
	Row %	40.0	0	60.0	0	0	4.2
	Column %	4.3	0	10.0	0	0	
	Total %	1.7	0	2.5	0	0	
Total	#	46	40	30	1	3	120
	%	38.3	33.3	25.0	0.8	2.5	100.0

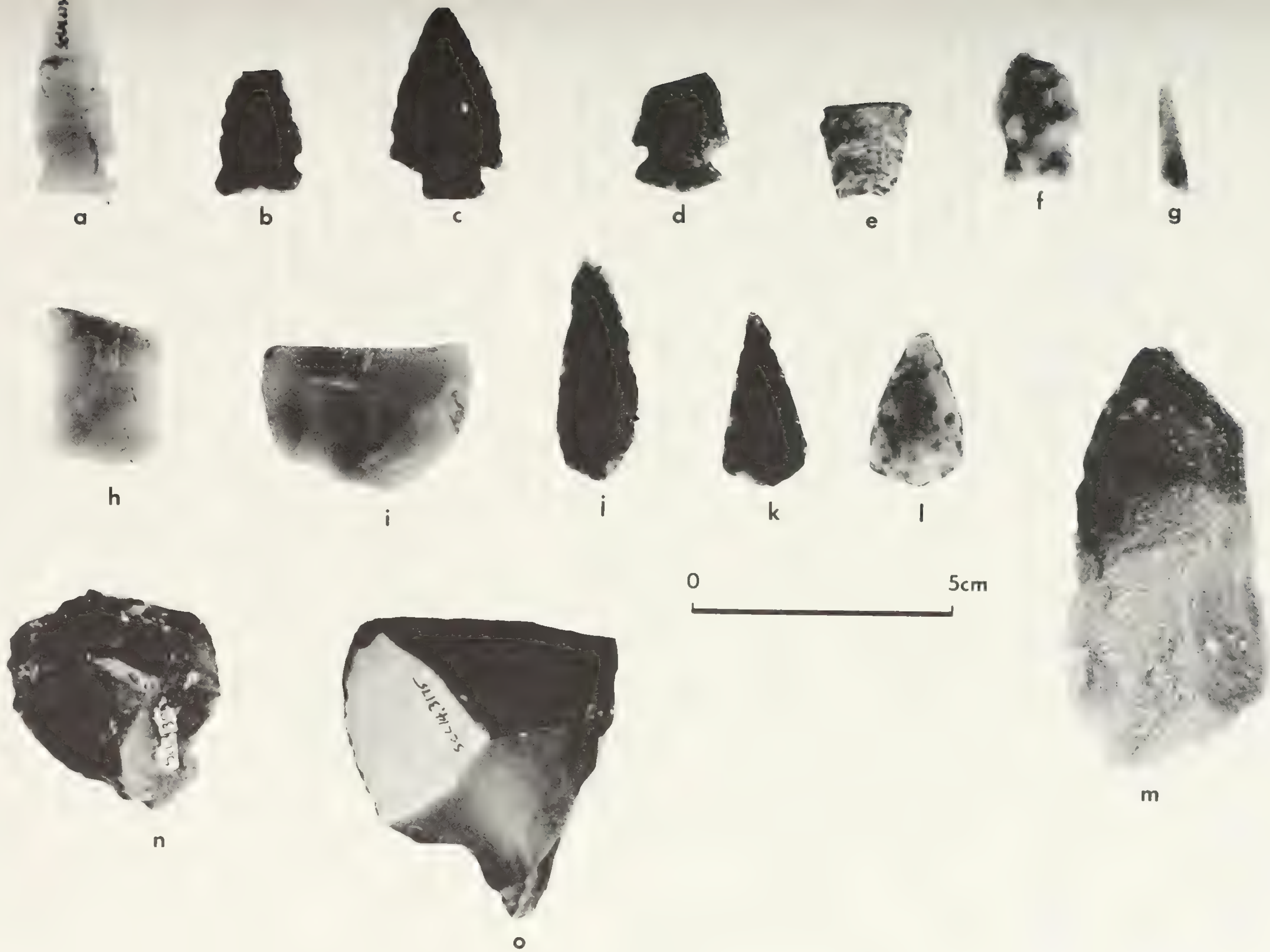


Figure 35. Example of flaked stone artifact assemblage from Component III, Taliaferro site. a, Large, side-notched projectile point, Type II; b, Large, side-notched projectile point, Type III; c-d, Large, corner-notched projectile point; e, Large, lanceolate projectile point, Type II; f, Large, bifurcate-stemmed projectile point, Type II; g, Drill; h-i, Large preform; j, Small preform, Type I; k, Small preform, Type IIa; l, small preform, Type IIb; m, Blank; n, Preblank; o, Lateral retouched flake, Type I.

generally date between 1600 and 950 years ago, which is consistent with the age of most at the Taliaferro site (Holmer and Weder 1980).

Sites in southwest Wyoming of similar age as the Late Archaic Component III at the Taliaferro site often contain large, corner- and side-notched points. Corner-notched points are part of the flaked stone artifact assemblage for Component II at 48SW1242 dating to 2170 years ago (Hoefer 1986) and for Component II at 48SW1091 with an age of 2740 and 2070 years (O'Brien 1982). Component III (2250 and 2180 years B.P.) at the Maxon Ranch site is characterized by large, side-notched points (Harrell and McKern 1986). Though limited solely to the Late Archaic period at the Taliaferro site, large, corner-notched points occur in most cultural components ranging from 6800 to 400 years ago at the Deadman Wash site (Creasman 1984).

The one drill from Component III is a distal fragment of translucent algalitic chert. The seven final biface fragments are probably distal portions of projectile points. As with the other Archaic components, most of the complete preforms are large preforms of quartzite. One each of small preform Types I, IIa, and IIb also was recovered. Type I preforms occur at the Taliaferro site in the latter part of the Archaic period and the early portion of the Late Prehistoric. The Types IIa and IIb small preforms are shorter in length than the ones classified as Type I. They are part of the flaked stone artifact assemblage of the Late Archaic Component III and the four Late Prehistoric components. In addition to the complete preforms, 22 are fragments.

The material types of the 19 blanks and 16 preblanks are distributed among translucent and opaque algalitic cherts and quartzite. Slightly more than half of the blanks are opaque algalitic chert, and half of the preblanks are translucent algalitic chert. In contrast to the Early Archaic Component I where most bifaces are quartzite, algalitic cherts appear to have been the favored material for these artifacts during Late Archaic times. Ten indeterminate biface fragments also were recovered.

The six recovered retouched flakes are a Type III distal retouched, two Type I lateral retouched, and three irregular retouched flakes. The Type III large distal retouched flake is of quartzite, and similar ones are part of the artifact assemblages from most components. The Type I lateral retouched flakes have a straight margin along the working edge. Others are present in most components. The irregular retouched flakes have unifacial retouch along an irregular margin and probably were rejected before completion. The six utilized flakes are of quartzite, translucent and opaque algalitic chert, and Whiskey Buttes chert. Only one modified quartzite cobble was recovered from Component III deposits. Of the six cores, one is residual and the others are multidirectional.

Apparently the production of bifaces from cobbles was the major focus of the flaked stone manufacturing activities at the site during Component III times. The retouching of flakes into implements and the expedient modification of cobbles or pebbles were of only minor importance. Each stage in the reduction of bifaces occurred at the site, as evidenced by the recovery of end products, preforms, blanks, and preblanks. Most of these artifacts probably were rejected during manufacture, and many, especially the preforms, are incomplete. They probably were broken during production. Figure 36 illustrates the horizontal distribution of the two broken artifacts that were refitted. Translucent and opaque algalitic chert and quartzite are almost equally represented in the total flaked stone artifact collection. However, the cherts are slightly more important than quartzite.

The crosstabulation of debitage type by material type is shown in Table 10. Like Components I and II, quartzite is the dominant material type with 45.8% of the total. Opaque algalitic chert is the second most common type. This distribution of material types for the debitage is quite different from that for the recovered flaked stone artifacts from the component. Except for large preforms, translucent and opaque algalitic cherts are the most common material types for most artifact types. A similar pattern in the frequencies of material types between artifacts and debitage occurred in the Middle Archaic Component II. For Components II and III, quartzite cobbles probably were reduced further than those made of chert, which resulted in more quartzite flakes per artifact. Additionally, many of the finished quartzite implements may have been removed from the area of production and used elsewhere.

The majority of the debitage consists of tertiary flakes with 57.1% of the total. Secondary flakes are represented by 21.8% and primary flakes by 12.2%. As shown in Appendix B, these percentages correspond to the expected ratio of flake types if all stages in the bifacial reduction sequence were performed at a site. The percentages for the flake types of translucent and opaque cherts are different from those for quartzite. There are more primary and secondary flakes for the cherts than for quartzite. Again, these distributions may indicate that many of the translucent and algalitic chert preblanks and blanks were rejected in the early stages of reduction and only quartzite bifaces were reduced into preforms at the site. The higher percentages of quartzite tertiary flakes compared to other material types represented in the collection may be due to differences in size and shape of the cobbles. Quartzite cobbles are larger, and only the first few flakes removed would contain cortex. In contrast, most flakes from the small, thin chert cobbles or pebbles would have some cortex.

Other Artifacts

Two hammerstones and seven pieces of groundstone were recovered from Component III deposits (Appendix B). Of the hammerstone, one measures 58.4 x 38.7 x 23.4 mm and the other is 60.8 x 36.9 x 27.4 mm. Both are of quartzite. The groundstone implements include two shaped manos, one unshaped mano, one unshaped slab metate, and three indeterminate fragments of groundstone. The shaped manos are bifacially ground and pecked, the unshaped mano is unifacially ground, and the unshaped metate is unifacially pecked.

Groundstone implements are more common in Component III than in the two earlier Archaic components at the Taliaferro site though groundstone artifacts are even more numerous in the Late Prehistoric components. In southwest Wyoming, other excavated sites dating to the Late Archaic period that yielded groundstone include Component VII at Deadman Wash (Armitage et al. 1982), Component II at 48SW1091 (O'Brien 1982), and Component III at Maxon Ranch (Harrell and McKern 1986). Each of these sites also produced groundstone from earlier deposits.

Plant Macrofossils

The fill from the six pit features was floated and examined for plant macrofossils (Appendix C). A total of 34 charred seeds was recovered from three of the features. Except for one Cruciferae seed, all the rest are from goosefoot (Chenopodium sp.) and 29 of these were found in Feature 36, an irregular-shaped pit. The single Cruciferae seed, along with one goosefoot seed, came from Feature 28. The medium basin-shaped pit, Feature 20, yielded three goosefoot seeds.

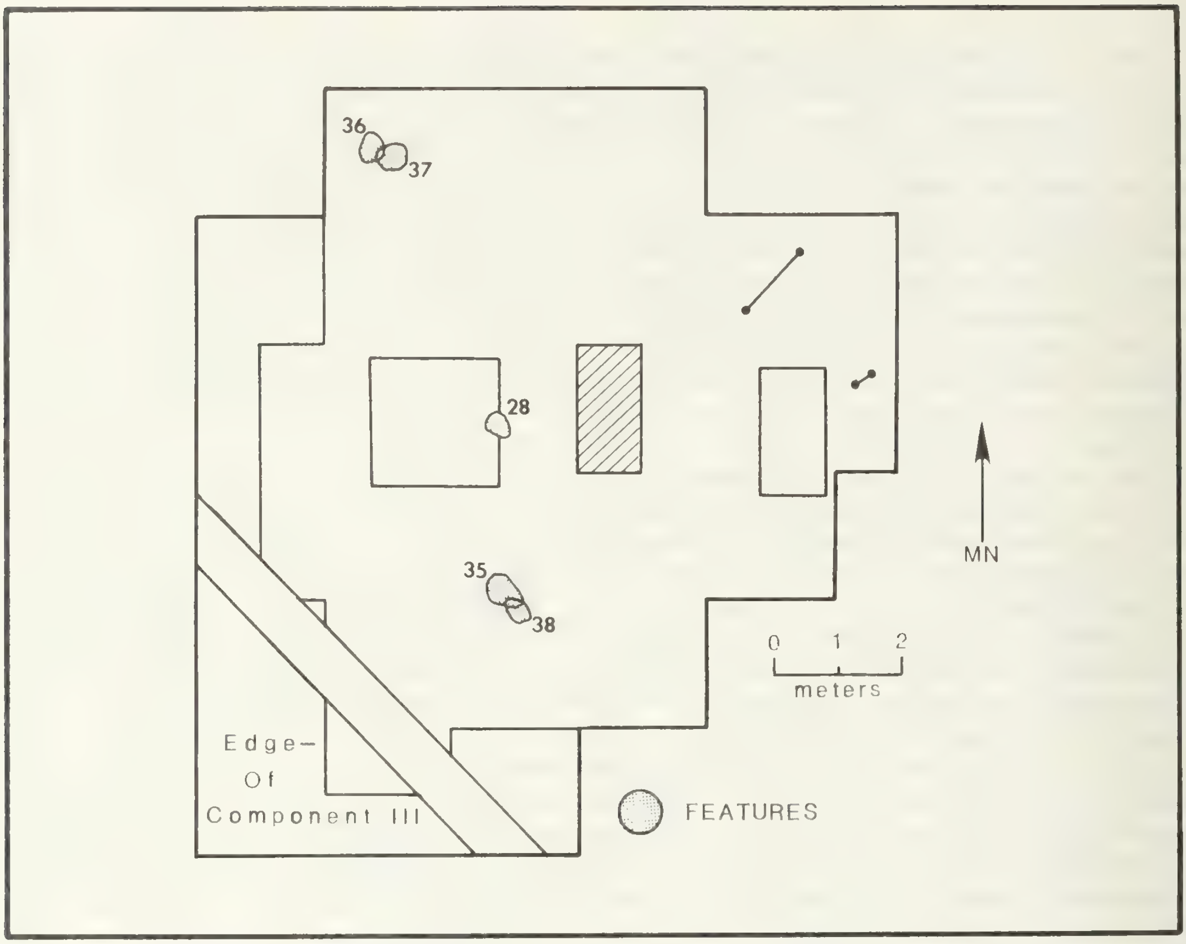


Figure 36. Plan map of the south half of Excavation Area A showing the horizontal distribution of the artifacts that were refitted, Component III, Taliaferro site.

Goosefoot seeds are by far the most common plant macrofossil in the assemblage from the Taliaferro site. Except for the Early Archaic Component I, all features containing plant macrofossils produced Chenopodium. It is a weedy annual which invades cultivated places and waste areas. At present, C. berlandieri grows on the playa adjacent to the Taliaferro site. The Cruciferae (mustard family) seed may belong to flaxleaf mustard (Schoenocrambe linlifolia) or peppergrass (Lepidium sp.); both are common species in the Green River Basin.

As with the other two Archaic period components at the Taliaferro site, charred seeds from the Late Archaic Component III are relatively rare when compared to the Late Prehistoric period. From this evidence there appears to be a marked change in subsistence patterns, which is expressed in a greater reliance on seed foods after the Archaic period. This is consistent with the data from other sites in southwest Wyoming where few components dating before the Late Prehistoric period have charred seeds.

Pollen

Samples from the fill of three pit features and a piece of groundstone were processed and counted for pollen (Appendix D). The pit features examined were Feature 20 (a medium basin-shaped pit), Feature 37 (a rock-filled basin), and Feature 38 (a rock-filled basin). Each of the rock-filled basins was just below and to the side, as well as slightly overlapping, an irregular-shaped

Table 10. Crosstabulation of debitage type by material type, Component III, Taliaferro site.

Debitage Type		Translucent Chert	Opaque Chert	Quartzite	Whiskey Buttes Chert	Obsidian	Other	Total
		Material Type						
Primary	#	159	399	370	30	3	3	964
	Row %	16.49	41.39	38.38	3.11	0.31	0.31	12.23
	Column %	12.99	14.85	10.25	10.44	7.69	12.50	
	Total %	2.02	5.06	4.69	0.38	0.04	0.04	
Secondary	#	357	760	517	74	10	7	1725
	Row %	20.70	44.06	29.97	4.29	0.58	0.41	21.89
	Column %	29.17	28.28	14.32	25.00	25.64	29.17	
	Total %	4.53	9.64	6.56	0.94	0.13	0.09	
Tertiary	#	551	1309	2447	160	24	9	4500
	Row %	12.24	29.09	54.38	3.56	0.53	0.20	57.10
	Column %	45.02	48.72	67.77	54.05	61.54	37.50	
	Total %	6.99	16.61	31.05	2.03	0.30	0.11	
Bifacial Thinning	#	99	62	27	6	1	1	196
	Row %	50.51	31.63	13.78	3.06	0.51	0.51	2.49
	Column %	8.09	2.31	0.75	2.03	2.56	4.17	
	Total %	1.26	0.79	0.34	0.08	0.01	0.01	
Shatter	#	51	139	247	23	1	2	463
	Row %	11.02	30.02	53.35	4.97	0.22	0.43	5.87
	Column %	4.17	5.17	6.84	7.77	2.56	8.33	
	Total %	0.65	1.76	3.13	0.29	0.01	0.03	
Tested Material	#	7	18	3	3	0	2	33
	Row %	21.21	54.55	9.09	9.09	0.00	6.06	0.42
	Column %	0.57	0.67	0.08	1.01	0.00	8.33	
	Total %	0.09	0.23	0.04	0.04	0.00	0.03	
Total	#	1224	2687	3611	296	39	24	7881
	%	15.53	34.09	45.82	3.76	0.49	0.30	100.00

pit, Features 36 and 35 respectively. The piece of groundstone, an unshaped slab metate, was recovered from the eastern portion of the south half of Excavation Area A.

The pollen types and frequencies from Feature 38 are generally similar to those for the natural pollen rain from Component III; however, the percentages for Cheno-am (goosefoot and amaranth families) pollen are lower, and the frequencies for sagebrush (Artemisia sp.) are higher than those recorded for the stratigraphic pollen samples associated with the component. The higher amounts of sagebrush pollen indicate that sagebrush was used for fuel in the feature. Charcoal from sagebrush also was recovered from the feature. For Feature 37, the higher than average frequencies of Cheno-am pollen suggests that goosefoot seeds or greens were processed in the vicinity of the rock-filled basin. This interpretation is supported by the plant macrofossil evidence. Feature 36, the irregular-shaped pit associated with Feature 37, yielded 29 charred goosefoot seeds, the majority of the plant macrofossils for the component. The other sampled feature, Feature 20, has the highest percentage of Cheno-am pollen of the examined features and groundstone for

Component III. The high percentage may reflect the use of goosefoot seeds or greens in or near the feature. The feature also produced three charred goosefoot seeds. Additionally, the basin may have been a storage pit that was lined with a plant of the Chenopodiaceae family.

The surface of the unshaped slab metate produced pollen frequencies similar to the three features and the stratigraphic pollen samples for the component. The percentages of Cheno-am pollen is the lowest of the four samples, and sagebrush is one of the highest, which is interesting in that charred goosefoot seeds are the most common plant macrofossil from the component. Apparently, goosefoot seeds were not ground on the recovered metate and the implement served another function. A single grain of Liliaceae pollen observed in the sample from the groundstone suggests that the seeds or roots of a lily, possibly sego lily (Calochortus nuttalli), were ground on the metate. Though charred lily seeds were found in some of the Late Prehistoric components at the Taliaferro site, they were absent in features from Component III, perhaps suggesting that the roots may have been ground.

Information from the plant macrofossil and microfossil analyses shows that the gathering and processing of seeds, and perhaps roots, was a more important activity in the Late Archaic Component III than it was in the earlier two Archaic period components. For Component III, seeds of goosefoot and Cruciferae (mustard family) probably were processed in the vicinity of some features, and roots from such plants as sego lily may have been ground at the site.

Animal Remains

A total of 84 specimens of bone and teeth was recovered from Component III (Appendix E). Table 11 presents the number of specimens and the minimum number of individuals by taxa or analytical group. The anatomical elements of the bison specimens are a distal portion of a right tibia, a complete left tarsal (2nd and 3rd), and two third phalange fragments. The one pronghorn bone is a portion of the left ischium. Other specimens identified to Artiodactyl include a pubis fragment, a midsection of a podial, a distal condyle of a second phalange, and tooth enamel fragments. The remaining specimens from this component are unidentifiable fragments.

As is evident from Table 11, specimens from large or medium mammals dominate the collection from Component III; only 15 specimens are from small or small to medium mammals, and these are unidentifiable fragments. Most of the large or medium to large mammal remains are probably Artiodactyl, especially bison or pronghorn, indicating a bias toward these animal species in the subsistence base during the Late Archaic period. Except for tooth enamel, all identified anatomical elements are portions of the hind quarters and distal extremities of the limbs. The prehistoric inhabitants during this period probably obtained bison and pronghorn in areas removed from the site and brought back only selected portions.

The fragmentary nature of the collection from Component III indicates that the selected portions of the animals brought back to the site were used to their maximum potential. In addition to meat, the bone probably was processed for its marrow, grease, and juice. This extensive processing of the bone also appears to have been a common practice during the four Late Prehistoric components at the site. Only 17 of the 84 specimens were burned, which suggests that exposing bone to direct fire was not an important part of the processing. The few fragments probably were burned accidentally during disposal. Unfortunately, the animal remains from Component III lack clues for discerning the season of site use.

Table 11. Animal remains by taxon, Component III, Taliaferro site.

Taxon	N	MNI
Bison (*Bison bison bison*)	4	1
Pronghorn (*Antilocapra americana*)	1	1
Artiodactyl	17	-
Large mammal	22	-
Medium to large mammal	23	-
Medium mammal	2	-
Small to medium mammal	9	-
Small mammal	6	-
Total	84	-

Key: N = number of identified specimens
MNI = minimum number of individuals

The distal limb extremities of bison and pronghorn were the only identified bone recovered from the Late Archaic Component II at 48UT401, a site located in the southern Green River Basin which dates between 2200 and 2400 years ago (Hoefer 1987). Site 48UT401 lacked remains from small animals. This is similar to the results from the Taliaferro site. Component III at the Maxon Ranch site, dating to 2250 and 2180 years ago, also yielded bone from the lower limbs of bison and pronghorn; but the collection contains mule deer, jackrabbit, and cottontail bone as well (Harrell and McKern 1986). In contrast to these Late Archaic components or sites, Component II at 48SW1242, located only 10 km southeast of the Taliaferro site, produced only bone identified to cottontail and jackrabbit. This component has an age of 2170 years ago.

Spatial Distribution of Remains

The spatial distribution of features, fire-cracked rock, flaked stone artifacts, groundstone, debitage, and bone was plotted for Component III. The relationships of these remains provide some clues about the type and location of activities conducted at the site. Interpretations concerning the types of activities conducted at the site during Component III times will be detailed in Chapter 5. The distribution of these remains was plotted only for the south half of Excavation Area A. The material belonging to Component III in the northern half occurred just below the surface and was associated with the eroded fire-cracked rock layer.

The distribution of the five features and fire-cracked rocks for the south half of Excavation Area A is shown in Figure 37. The double feature, Features 35 and 38, is located in the center of the excavation area. Just north of these two features, fire-cracked rock surrounds a rock-free area that is about a meter in diameter. Fire-cracked Rock Concentration E is to the southwest of the features. The other double feature, Features 36 and 37, is situated in the northwestern corner of the excavation area. This also is surrounded by a scattering of fire-cracked rock. Feature 28 is in the area between the two double features and is associated with Fire-cracked Rock Concentration C. Most of the fire-cracked rocks occur downslope, or to the east, of the features.

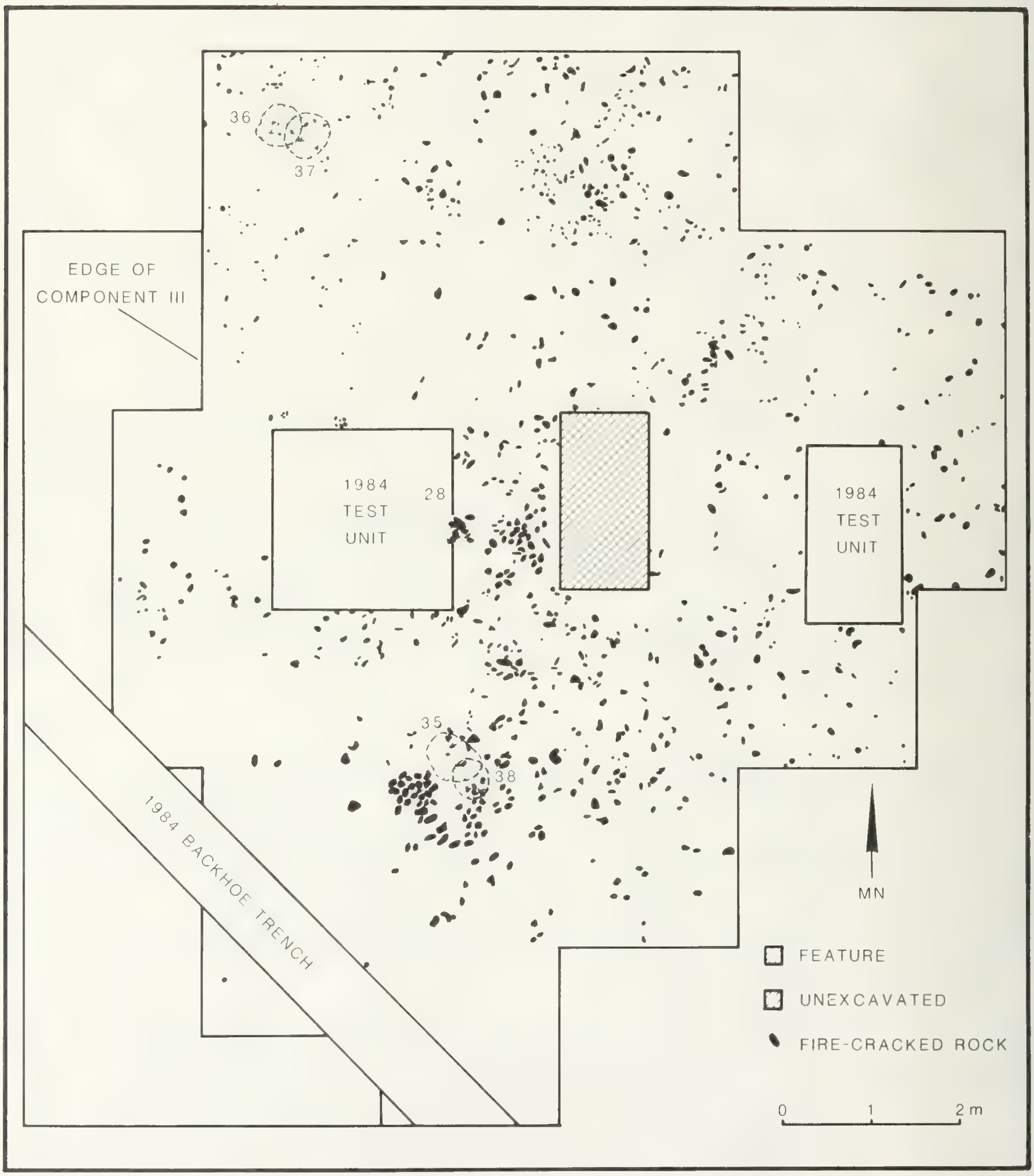


Figure 37. Plan map of the south half of Excavation Area A showing distribution of features and fire-cracked rock, Component III, Taliaferro site.

Figure 38 shows the distribution of the flaked stone artifacts and groundstone. The density values by square meter for all flaked stone artifacts across the excavation area were smoothed using trend surface analysis (Hodder and Orton 1976:155). The trend surface map indicates that the highest density of flaked stone artifacts is located in the northern portion of the excavation area to the east of Features 36 and 37.

Individual maps were made showing the number per square meter of projectile points, bifaces, retouched and utilized flakes, cores, and groundstone. Insufficient quantities of these artifact types precluded the use of trend surface analysis. The projectile points are scattered throughout but appear to be slightly more concentrated in the northern portion of the excavation area. The bifaces, which include preblanks, blanks, preforms, and indeterminate bifaces, also are distributed throughout. The few retouched and utilized flakes are concentrated in the center of the excavation area. The cores are primarily located in the southern portion, and the groundstone artifacts are in the north half. Overall, the bifaces occur throughout; and the other artifact types, being fewer in number, have a more limited distribution.

Figure 39 provides trend surface density maps for total debitage and individual maps for the various material types. The most dense area for total debitage occurs in the northern portion of the excavation area. This corresponds with the pattern for all flaked stone artifacts. Debitage is also fairly dense along the eastern half, which is downslope from the features. The individual trend surface maps of the various material types are similar to the one for total debitage. Most of the debitage is concentrated downslope from the features.

The distribution of bone is shown in Figure 40. Trend surface maps were made for both the number and weight of bone per square meter. The two maps contain different patterns. The density peak on the map for number of bone occurs in the northwest corner of the excavation area near Features 36 and 37. In contrast, the most dense area for weight is in the center adjacent to Feature 28. These differences in the distribution of bone indicate that small, fragmentary pieces are most dense in the northern portion and a few relatively large, complete elements occur in the center of the excavation area. From examination of the density maps broken down by taxa per square meter, the small, fragmentary bone in the northern portion appears to be from large mammals. The fairly complete elements near Feature 28 were identified as bison. Artiodactyl, predominately bison, and large mammal bone are most common in the areas surrounding each of the features. The few pieces of small mammal bone are present around Feature 28 in the center of the excavation area.

Component IV

Component IV is the earliest Late Prehistoric period component at the site and dates to 1500 years ago. It is located just below the dark midden deposit in the eastern half of Excavation Area B. The fire-cracked rock belonging to Component IV at the base of the midden formed a discrete layer, but some mixing of debitage may have occurred with the later Component V. A total of 58 m² of excavated area is included in Component IV.

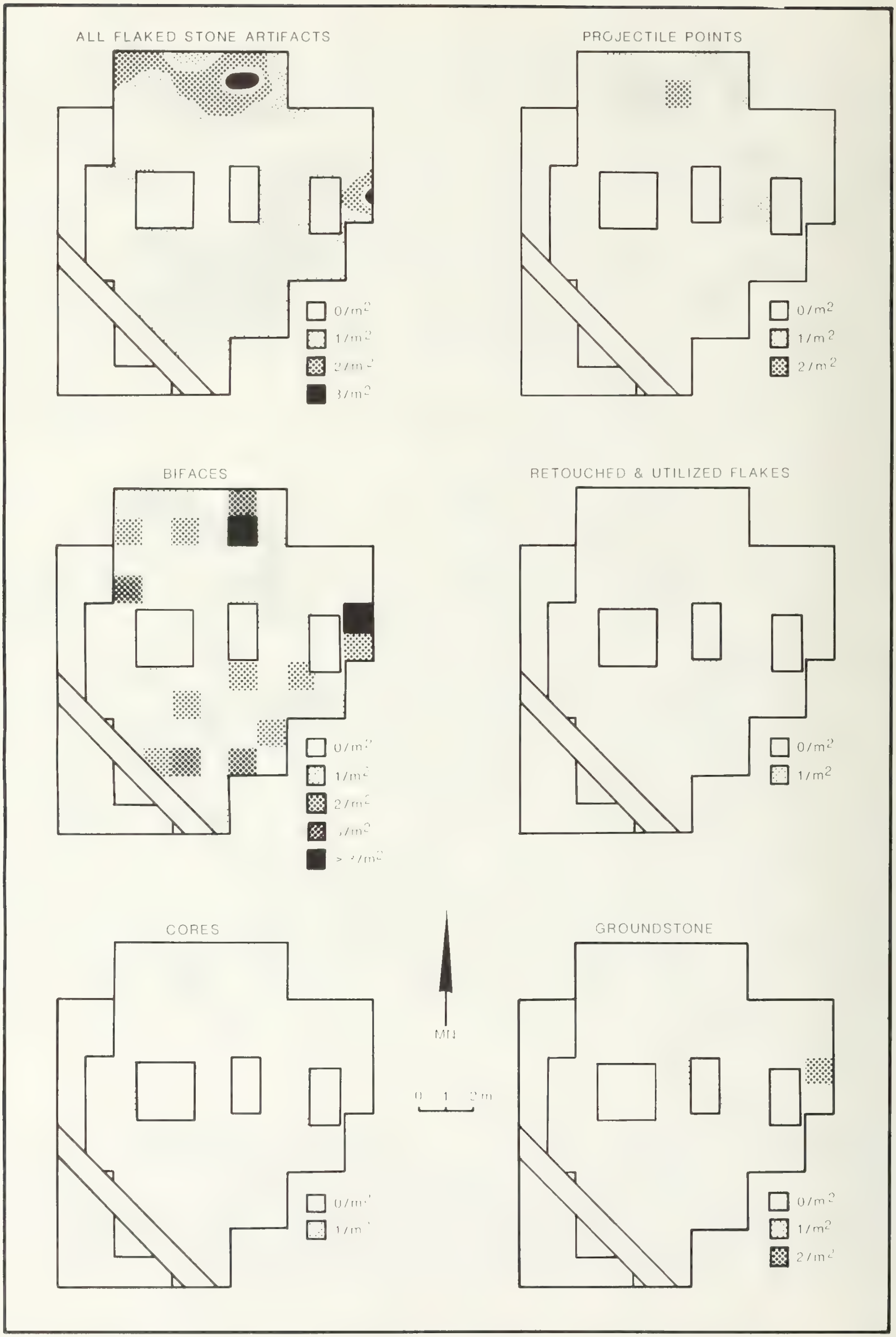


Figure 38. Plan maps of the south half of Excavation Area A showing the horizontal distribution of all flaked stone and groundstone tools, Component III, Taliaferro site.

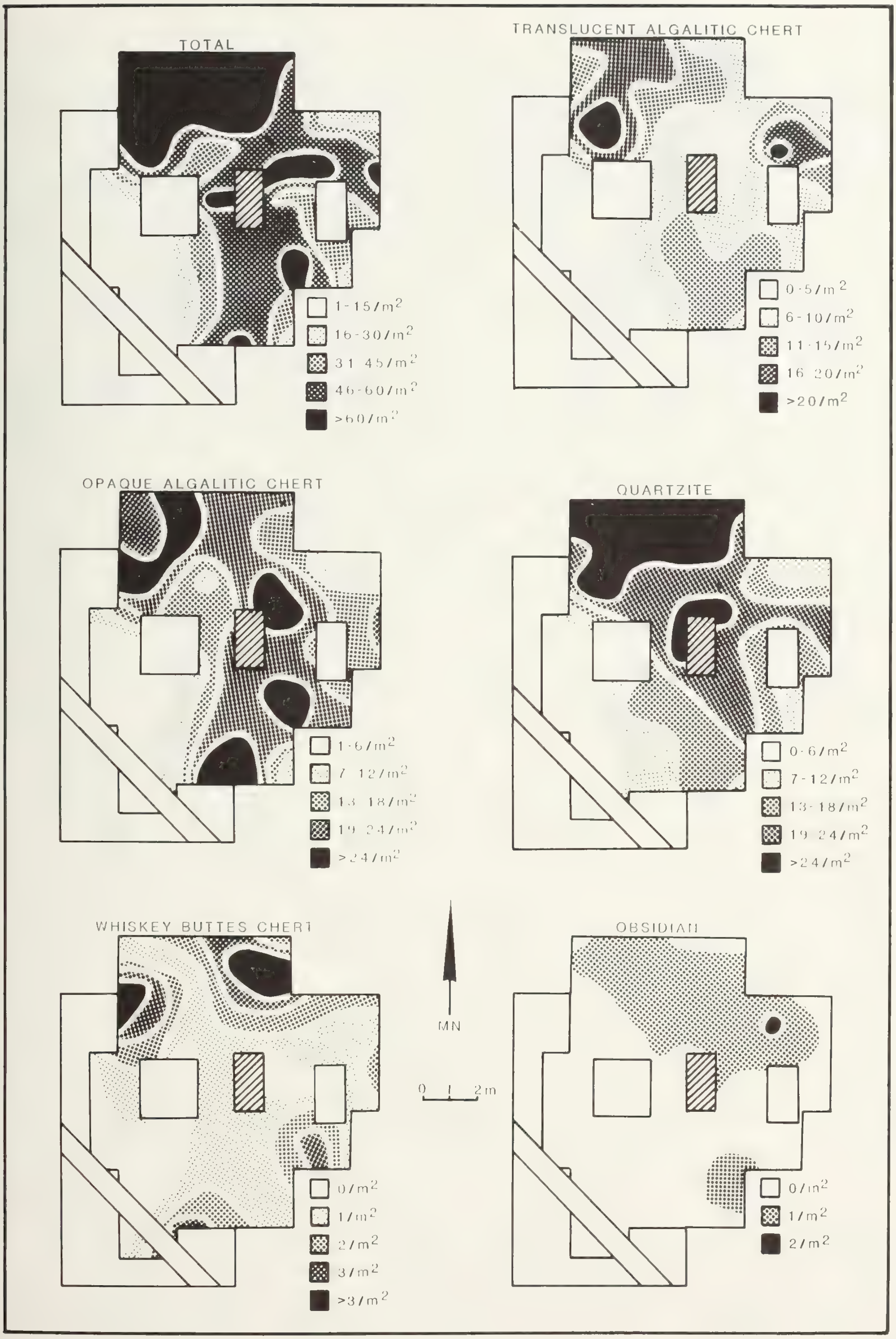


Figure 39. Plan maps of the south half of Excavation Area A showing the horizontal distribution of total debitage and material types, Component III, Taliaferro site.

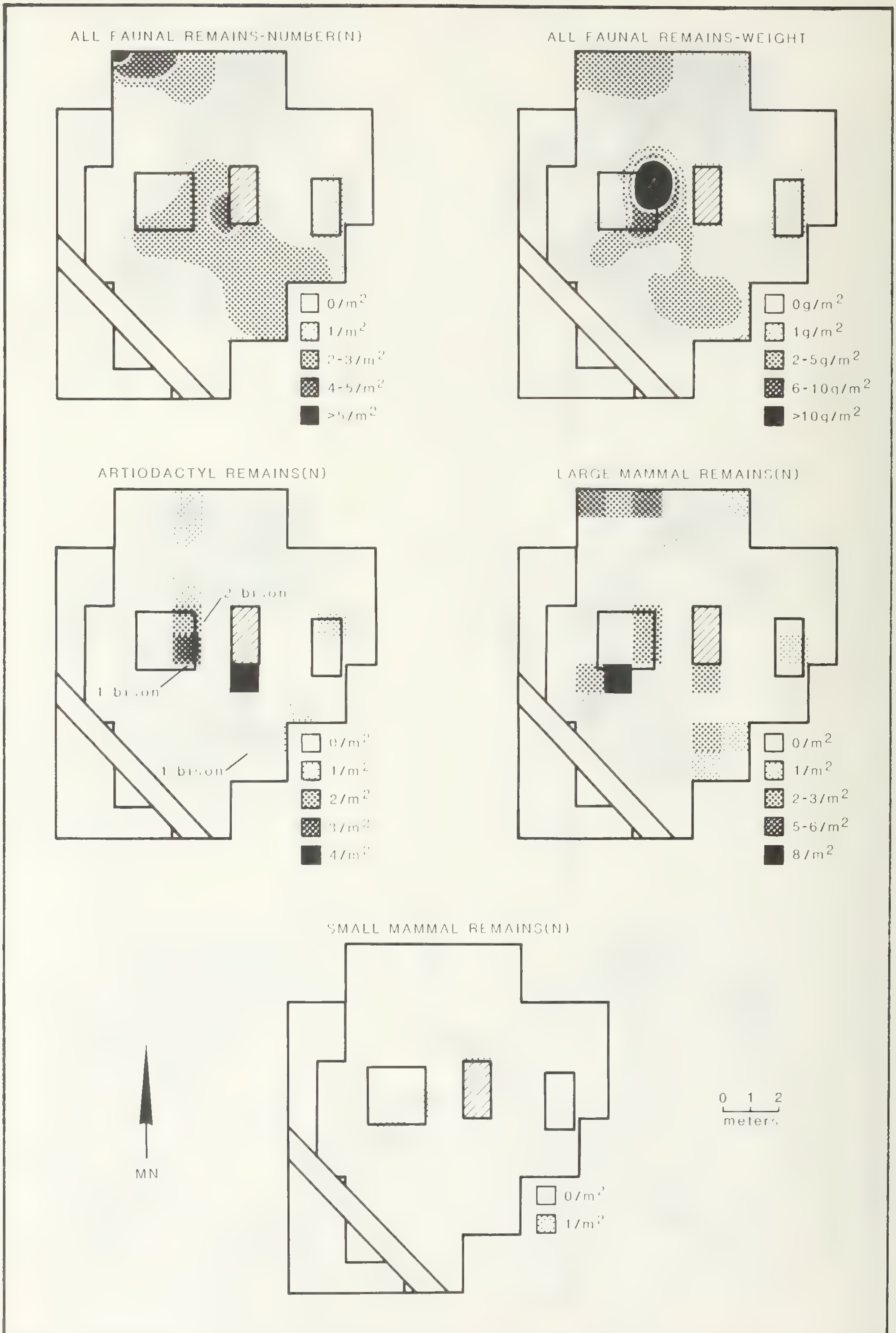


Figure 40. Plan maps of the south half of Excavation Area A showing the horizontal distribution of animal remains, Component III, Taliaferro site.

Features

Nine pit features were assigned to Component IV (Table 12). These include two large basins, Features 7 and 16; two medium basins, Features 17 and 26; two small basins, Features 5 and 18; two oxidized basins, Features 6 and 15; and an irregular-shaped pit, Feature 27. A complete description of these morphological types and their functional interpretations is provided in Appendix A. Seven of thenine features formed two groups of associated features referred to as multiple feature groups.

One of these multiple feature groups consisted of a large basin, Feature 16; an oxidized basin, Feature 15; a small basin, Feature 18; and a medium basin, Feature 17. These four pit features occurred within a 4 m² area and were dug into the sterile deposits just below the dark midden (Figure 41).

The large basin of this group, Feature 16, measured 120 x 96 x 20 cm and contained a dark fill with large amounts of charcoal (Figure 42). Six bone fragments were recovered. Of the six, the largest was a pronghorn (Antilocarpa americanus) distal humerus fragment. A large mammal rib fragment, a portion of a phalange from a deer or pronghorn sized animal, and unidentifiable mammal bone fragments were among the other bone found in the fill. Nine taxa of charred seeds, dominated by goosefoot (Chenopodium sp.), were recovered during the plant macrofossil analysis.

The second pit feature associated with this group was Feature 15, an oxidized basin measuring 46 x 45 x 20 cm (Figure 41). It contained a dark fill with large amounts of charcoal as well as bone, charred seeds, and debitage. The bone includes a burned muskrat (Ondatra zibethicus) scapula fragment, a vertebra from a sucker (Catostomes sp.), jackrabbit (Lepus sp.) bone, and unidentifiable large and small mammal bone fragments. For the four features in this group, Feature 15 yielded, by far, the most charred seeds by volume. Most were Chenopodium, and those in the Cruciferae (Mustard) family were the second most common (Appendix C).

The small basin, Feature 18, in this multiple feature group consisted of gray sediment with only a few small charcoal flecks and lacked bone and debitage; however, seven taxa of charred seeds were recovered from the fill (Appendix C). The feature measured 30 x 28 x 9 cm. The fourth pit feature was a medium basin, Feature 17, that measured 41 x 40 x 22 cm. The dark fill had a large amount of charcoal, five taxa of charred seeds, and debitage. Charcoal from the feature produced a radiocarbon estimate of 1500 years ago.

The other multiple feature group had a large basin, Feature 7; an oxidized basin, Feature 6; and a small basin, Feature 5. They also were excavated into the sterile deposits just below the dark midden and occur within a 4 m² area. The large basin, Feature 7, measured 120 x 87 x 7 cm and contained dark-stained sediment with charcoal and six taxa of charred seeds. Feature 6, the oxidized basin, was 45 x 39 x 7 cm and contained a dark fill with large amounts of charcoal and three taxa of charred seeds. The small basin, Feature 5, had a gray fill with small amounts of charcoal, a small mammal bone fragment, five taxa of charred seeds, and a piece of debitage. Fire-cracked Rock Concentration B was also associated with Feature 5. It measured 90 x 70 cm and had 46 rocks.

Overall, both multiple feature groups include a large basin, measuring over 100 cm in diameter and containing large amounts of charcoal; an oxidized basin, measuring about 45 cm in diameter with dark sediment and a large amount of charcoal; and a small basin with a gray fill and little charcoal. The features were dug into sterile deposits just below the dark midden, and fire-cracked rock was scattered or piled in the area surrounding the features.

Table 12. Characteristics of pit features, Component IV, Taliaferro site.

Feature No.	Type	Volume (liter)	Area (cm^2)	Artifacts	Debitage (total)	Bone No.	Bone wt.(g)	Plant Macro-fossil[a]	Charcoal[b]
5	Small Basin	7.5	1963.0	-	1	1	0.1	5	some
6	Oxidized Basin	6.5	1385.0	-	-	-	-	3	much
7	Large Basin	38.0	8413.0	-	-	-	-	6	much
15	Oxidized Basin	21.5	1626.0	-	41	25	3.4	7	much
16	Large Basin	120.5	9161.0	Final biface tip	66	6	16.4	9	much
17	Medium Basin	19.0	1288.0	-	11	-	-	5	much
18	Small Basin	4.0	660.5	-	-	-	-	7	little
26	Medium Basin	26.0	3578.5	Preform fragment	25	23	24	6	some
27	Irregular-shaped	3.0	962.0	-	-	-	-	1	some

[a]Number of taxa

[b]Relative amount

All yielded several taxa of charred seeds. One multiple feature group had an additional medium basin.

Groups of features, known as the "tri-hearth complex," are present at several sites in the Wyoming Basin (Schroedl 1985). They usually consist of a triangular configuration of three associated pits that occur just below a dark stained layer containing fire-cracked rock, bone, artifacts, and debitage. All date to the early part of the Late Prehistoric period around 1300 to 1500 years ago. Though these tri-hearths date to the same period and are found in similar stratigraphic situations, the size, shape, and contents of the associated features vary.

A tri-hearth from the High Point #7 site in the Red Desert contained a pit, Feature A, measuring roughly 50 cm in diameter and over 70 cm in depth (Brown 1978). A 15 cm layer of nearly pure charcoal at the bottom of this pit was covered with sandstone slabs. Above the sandstone, the sides of the pit were oxidized, and the fill consisted of sand mixed with charcoal flecks. The other two features were fairly shallow, basin-shaped pits with a fill of charcoal flecks mixed with sand. Another tri-hearth was excavated at 48SW1873 in the Red Desert (Reust et al. 1982). One feature was a bell-shaped pit 45 cm in diameter with a depth of 60 cm. It had oxidized walls and contained a fill of charcoal-rich sand with two distinct rock layers. Nine small mammal bone fragments were also recovered. Another of the associated

Figure 41. Feature 16, a large basin; Feature 15, an oxidized basin; Feature 18, a small basin; and Feature 17, a medium basin, showing one of the multiple feature groups after excavation, Component IV, Taliaferro site.

Figure 42. Feature 16, a large basin before excavation (left), and Feature 15, an oxidized basin after excavation (right) both part of a multiple feature group, Component IV, Taliaferro site.

features at High Point #7 was a basin-shaped pit measuring 65 cm in diameter and 40 cm in depth. It had a layer of rock and oxidized sides. The third feature was a basin-shaped pit 55 cm in diameter and 40 cm deep. This pit had two layers of rock, oxidation along its sides, and a dense concentration of charcoal below the lower rock layer.

A configuration of three features was found at the Paradox Ridge site in the Rock Springs Uplift (Gardner et al. 1982). These pits were shallower than those recorded in the Red Desert (being only 10 to 22 cm in depth). They measured 70 x 46 cm, 60 x 65 cm, and 30 x 44 cm and lacked fire-cracked rock. Six burned mammal bone fragments were recovered from the fill of one of the features. A fourth example of an excavated tri-hearth comes from 48UT199 in the Green River Basin (Schroedl 1985). The central pit, termed a roasting pit, measured 80 x 70 cm and 50 cm deep and contained a dark sediment with little charcoal, but the fill had some bone fragments and fire-cracked rock. An associated feature, a basin-shaped pit, produced fire-cracked rocks, bone, and charcoal. It measured 48 x 40 cm and 21 cm in depth. The third pit, referred to as a trash pit, measured 29 x 24 cm and 18 cm deep. The matrix of this pit was a dark sand full of fire-cracked rock, bone fragments, debitage, and some charcoal.

As is shown in the above examples, there is much variation in what is grouped under the tri-hearth complex. The two multiple feature groups from Component IV at the Taliaferro site, consisting of a large basin, an oxidized basin, and a small basin, are also quite different from the others; however, as with the others, those from the Taliaferro site were dug into the sterile deposits below a dark midden layer and date to the early part of the Late Prehistoric period. Because more than three pits may be represented in one of these feature groups, as is the case at the Taliaferro site, the tri-hearth complex should more correctly be known as a multiple feature group.

Depending on the type of features associated with the tri-hearths, different functional interpretations have been posited. Brown (1978) proposes that the pits in a tri-hearth were used simultaneously in cooking or processing activities. For tri-hearths containing a deep roasting pit, he suggests that one pit served as a fire-hearth, from which fire was obtained for the roasting operation in another pit, while the third pit was for refuse. Those consisting of small pits with fire-cracked rock and burned bone were used for animal processing activities, and tri-hearths with deep pits were important in preparing plant foods. Other suggested tasks for these features include heating stones for roasting or boiling of animal or plant resources, preparing meat for immediate consumption, and breaking bones for bone grease production (Schroedl 1985).

The two multiple feature groups from the Taliaferro site probably represent several serial or simultaneous tasks. Because of the large number and wide variation of the charred plant macrofossils recovered from these features, they probably were used in seed processing activities. The oxidized basin could have served as a firepit where hot coals could be obtained for use in roasting the seeds. The seeds most likely were parched with the coals in basket trays as described in the historic and ethnographic literature (Chamberlin 1911; Powell 1875). The rejected coals could have been dumped in the large basin, or the large basin could have been used to bake seed cakes in hot ashes. During this processing, as well as in the threshing and winnowing activities, seeds could be accidentally incorporated into these features. The recovery of bone fragments within the fill and around the pits in one of the multiple feature groups indicates that some animals were cooked and consumed in the area. Rocks heated in one of the hearths could have been used to boil water in baskets for bone grease production as well.

In addition to the seven pits associated with the two multiple feature groups, Feature 26, a medium basin, and Feature 27, an irregular-shaped pit, occurred in Component IV. The medium basin contained a dark-stained sediment with some charcoal, bone, and six taxa of charred seeds. A fetal deer or pronghorn long bone fragment, jackrabbit (Lepus sp.) bone fragments, a burned vole (Microtus sp.) mandible, and unidentifiable small mammal bone fragments were among the recovered bone. The irregular-shaped pit, Feature 27, was partly deflated and consisted of gray sediment containing five charred goosefoot (Chenopodium sp.) seeds.

Two fire-cracked rock concentrations were excavated in Component IV (Appendix A). Concentration B was associated with Feature 5, a small basin that was part of a multiple feature group. The other, Concentration A, was an isolated pile of fire-cracked rocks measuring 73 x 66 cm (Figure 43).

Flaked Stone Artifacts

A total of 75 flaked stone tools and 3363 pieces of debitage was recovered from Component IV deposits. They include 10 projectile points, 2 final biface tips, 34 preforms or fragments, 11 blanks, 5 preblanks, 3 indeterminate bifaces, 2 retouched flakes, 5 utilized flakes, 2 modified cobbles or pebbles, and a core (Table 13). Figure 44 illustrates an example of the flaked stone artifact types recovered from Component IV.

The ten projectile points belonging to Component IV were classified as small, corner-notched: seven are of translucent algalitic chert, two are of obsidian, and one is of quartzite. The presence of small points is generally thought to mark the use of the bow and arrow (Holmer 1986). The earliest occurrence of small points at archaeological sites in southwest Wyoming is about 1550 years ago (Hoefer 1986). The small, corner-notched points from the Late Prehistoric Component IV have an age of 1500 years ago. An additional 62 of these points were recovered from the other three Late Prehistoric components.

Small, corner-notched points occur as early as 1600 years B.P. at Cowboy Cave and are part of the artifact assemblages from Fremont sites until about 950 years ago (Holmer and Weder 1980). This temporal range is consistent with their age at the Taliaferro site as well as at other excavated sites in southwest Wyoming. Component 3 at 48SW1242, dated at 1550 and 1540 years ago, is another site in the Green River Basin of similar age as Component IV containing small, corner-notched points (Hoefer 1986).

The two final biface tips are probably distal portions of projectile points. Only one large preform was recovered, and the remaining seven complete preforms were classified as small preform Types I, IIa, and IIb. Type I preforms occur at the Taliaferro site in the later part of the Archaic period and the early portion of the Late Prehistoric. The Types IIa and IIb small preforms are part of the flaked stone artifact assemblage of the Late Archaic Component III and the four Late Prehistoric components. For Component IV, most (26) of the preforms are fragments. Except for one large preform of quartzite, all preforms and fragments are of chert. Similar small preforms, identified as final bifaces, are associated with Component III at 48SW1242 (Hoefer 1986).

Most of the 11 blanks are of translucent and opaque algalitic chert, and none are of quartzite. This distribution of material type contrasts with that of the Archaic period components, especially Component I, where many of the blanks and preforms are of quartzite. Material types of the five preblanks

Figure 43. Fire-cracked Rock Concentration A, Component IV, Taliaferro site. Small squares on scale equal one centimeter.

Table 13. Crosstabulation of flaked stone artifact type by material type, Component IV, Taliaferro site.

Artifact Type		Material Type: Trans-lucent Chert	Opaque Chert	Quartzite	Whiskey Buttes Chert	Obsidian	Total
Small, Corner-Notched Point	#	7	0	1	0	2	10
	Row %	70.0	0	10.0	0	20.0	13.3
	Column %	20.0	0	8.3	0	50.0	
	Total %	9.3	0	1.3	0	2.7	
Final Biface Tip	#	1	1	0	0	0	2
	Row %	50.0	50.0	0	0	0	2.7
	Column %	2.9	5.3	0	0	0	
	Total %	1.3	1.3	0	0	0	
Large Preform	#	0	0	1	0	0	1
	Row %	0	0	100.0	0	0	1.3
	Column %	0	0	8.3	0	0	
	Total %	0	0	1.3	0	0	
Small Preform, Type I	#	0	1	0	2	0	3
	Row %	0	33.3	0	66.7	0	4.0
	Column %	0	5.3	0	40.0	0	
	Total %	0	1.3	0	2.7	0	
Small Preform, Type IIa	#	1	2	0	0	0	3
	Row %	33.3	66.7	0	0	0	4.0
	Column %	2.9	10.5	0	0	0	
	Total %	1.3	2.7	0	0	0	
Small Preform, Type IIb	#	1	0	0	0	0	1
	Row %	100.0	0	0	0	0	1.3
	Column %	2.9	0	0	0	0	
	Total %	1.3	0	0	0	0	
Preform Fragment	#	15	9	0	2	0	26
	Row %	57.7	34.6	0	7.7	0	34.7
	Column %	42.9	47.4	0	40.0	0	
	Total %	20.0	12.0	0	2.7	0	
Blank	#	5	5	0	1	0	11
	Row %	45.5	45.5	0	9.1	0	14.7
	Column %	14.3	26.3	0	20.0	0	
	Total %	6.7	6.7	0	1.3	0	
Preblank	#	1	1	2	0	1	5
	Row %	20.0	20.0	40.0	0	20.0	6.7
	Column %	2.9	5.3	16.7	0	25.0	
	Total %	1.3	1.3	2.7	0	1.3	
Indeterminate Biface	#	2	0	1	0	0	3
	Row %	66.7	0	33.3	0	0	4.0
	Column %	5.7	0	8.3	0	0	
	Total %	2.7	0	1.3	0	0	
Distal Retouched Flake, Type II	#	1	0	0	0	0	1
	Row %	100.0	0	0	0	0	1.3
	Column %	2.9	0	0	0	0	
	Total %	1.3	0	0	0	0	
Lateral Retouched Flake, Type II	#	1	0	0	0	0	1
	Row %	100.0	0	0	0	0	1.3
	Column %	2.9	0	0	0	0	
	Total %	1.3	0	0	0	0	

Table 13. Concluded.

Artifact Type		Trans-lucent Chert	Opaque Chert	Quartzite	Whiskey Buttes Chert	Obsidian	Total
		Material Type					
Utilized Flake	#	0	0	4	0	1	5
	Row %	0	0	80.0	0	20.0	6.7
	Column %	0	0	33.3	0	25.0	
	Total %	0	0	5.3	0	1.3	
Modified Cobble	#	0	0	2	0	0	2
	Row %	0	0	100.0	0	0	2.7
	Column %	0	0	16.7	0	0	
	Total %	0	0	2.7	0	0	
Multidirectional Core	#	0	0	1	0	0	1
	Row %	0	0	100.0	0	0	1.3
	Column %	0	0	8.3	0	0	
	Total %	0	0	1.3	0	0	
Total	#	35	19	12	5	4	75
	%	46.7	25.3	16.0	6.7	5.3	100.0

include translucent and opaque algalitic chert, obsidian, and quartzite. Three indeterminate bifaces of translucent algalitic chert and quartzite also were recovered.

The two retouched flakes are a Type II distal retouched and a Type II lateral retouched. Type II distal retouched flakes are described often in the archaeological literature with the functional term "end scraper." In addition to unifacial retouch along the distal margin, the specimen from Component IV has lateral retouch from shaping. Type II flakes also are part of the flaked stone artifact assemblages from the Early Archaic Component I and the Late Prehistoric Components VI and VII at the Taliaferro site. The Type II lateral retouched flake has unifacial retouch along a lateral curved margin and could be referred to as a "side scraper." In addition to the one from Component IV, this type is associated with the Early Archaic Component I and the Late Prehistoric Component VI. Distal and lateral retouched flakes also are present at other Late Prehistoric sites in the area, including Component 2 with radiocarbon ages of 1440 and 1190 years at the Sheehan site (Bower et al. 1986) and at the Austin Wash site dating between 1070 and 1370 years ago (Schroedl 1985). Of the five utilized flakes, four are of quartzite, and one is of obsidian. Two modified cobbles or pebbles and a multidirectional core were found in Component IV deposits.

As is evident by the recovery of mostly bifaces, such as preblanks and blanks, bifacial reduction was the favored technique for flaked stone implement production during Component IV times. Apparently all steps in the bifacial reduction sequence were performed at the site. The retouching of flakes into tools and the expedient modification of cobbles and pebbles were less important activities. Many of the artifacts, especially the preforms, are incomplete and probably were broken and rejected during manufacture.

Figure 44. Example of flaked stone artifact assemblage from Component IV, Taliaferro site. a-c, Small, corner-notched projectile point; d, Large preform; e-f, Small preform, Type I; g-h, Small preform, Type IIa; i, Small preform, Type IIb; j, Blank; k, Preblank; l-m, Modified cobble; n, Lateral retouched flake, Type II; o, Distal retouched flake, Type II.

Figure 45 illustrates the horizontal distribution of the broken artifacts that were refitted.

A majority (46.7%) of the flaked stone artifacts are of translucent algalitic chert, and the next most common material type is opaque algalitic chert. The heavy reliance on algaltic cherts for toolstone during the Late Prehistoric Component IV contrasts with the pattern for the Archaic period components. For the Early Archaic Component I, quartzite was the favored material type, and the artifacts are more evenly distributed among the algalitic cherts and quartzite for the Middle and Late Archaic Components II and III. Like Component IV, the other Late Prehistoric components are dominated by translucent algalitic chert artifacts as well.

The crosstabulation of debitage type by material type is detailed in Table 14. Translucent algalitic chert is the dominant material type with 52.7% of the total. Almost equal amounts of opaque algalitic chert (21.1%) and quartzite (20.7%) are present in the debitage collection. The distribution of material types for the debitage is similar to the frequencies for the flaked stone artifacts, which indicates that artifacts of all material types were entirely manufactured at the site.

The majority of the debitage consists of tertiary flakes with 51.6% of the total. Secondary flakes are represented by 26.7% and primary flakes by 8.7%. As shown in Appendix B, these percentages correspond to the expected ratio of flake types if all stages in the bifacial reduction sequence were preformed at the site. The frequency of flake types broken down for each

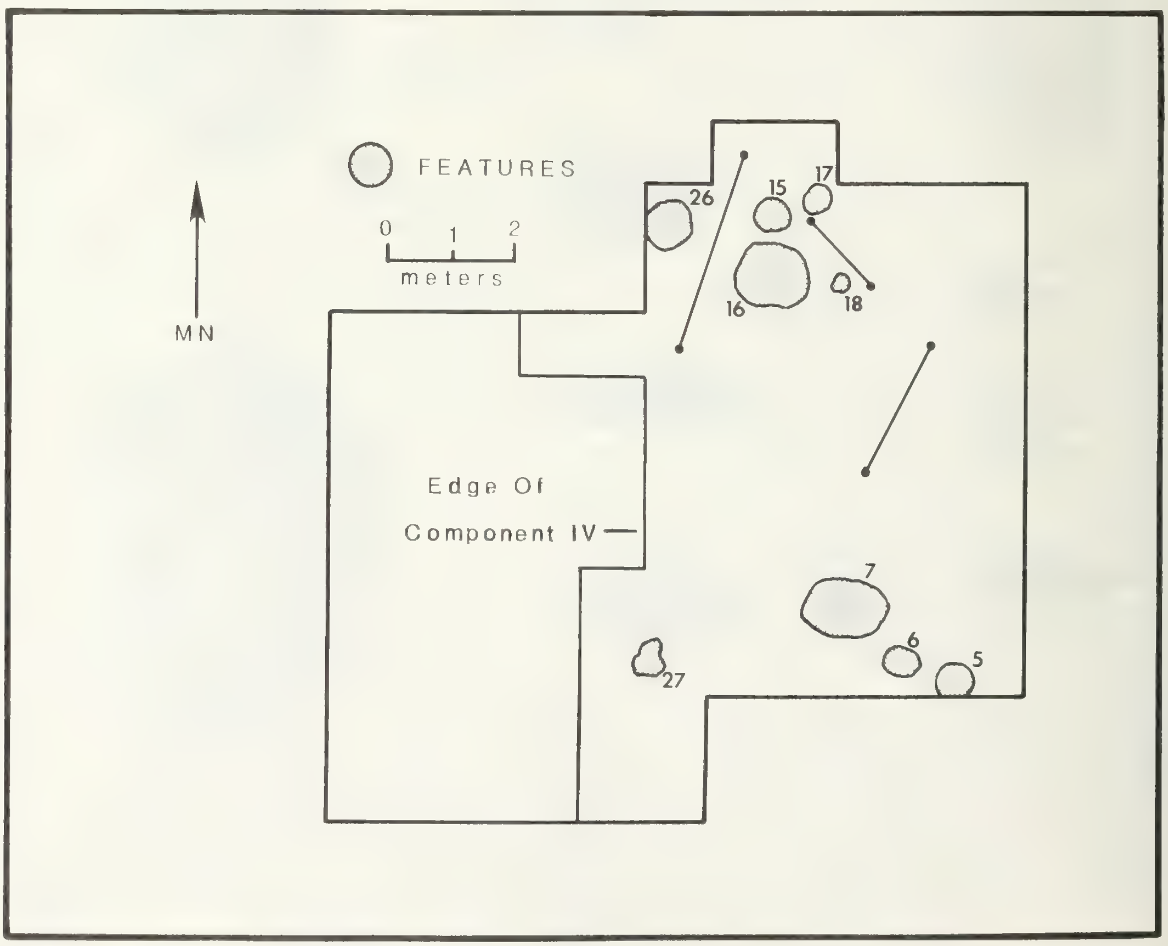


Figure 45. Plan map of Excavation Area B showing the horizontal distribution of the broken artifacts that were refitted, Component IV, Taliaferro site.

Table 14. Crosstabulation of debitage type by material type, Component IV, Taliaferro site.

Flake Type		Material Type						
		Trans-lucent Chert	Opaque Chert	Quartzite	Whiskey Buttes Chert	Obsidian	Other	Total
Primary	#	196	35	47	4	7	4	293
	Row %	66.89	11.95	16.04	1.37	2.39	1.37	8.71
	Column %	11.05	4.92	6.74	4.71	9.09	20.00	
	Total %	5.83	1.04	1.40	0.12	0.21	0.12	
Secondary	#	566	170	125	15	18	3	897
	Row %	63.10	18.95	13.94	1.67	2.01	0.33	26.67
	Column %	31.92	23.91	17.93	17.65	23.38	15.00	
	Total %	16.83	5.06	3.72	0.45	0.54	0.09	
Tertiary	#	748	414	464	54	44	11	1735
	Row %	43.11	23.86	26.74	3.11	2.54	0.63	51.59
	Column %	42.19	58.23	66.57	63.53	57.14	55.00	
	Total %	22.24	12.31	13.80	1.61	1.31	0.33	
Bifacial Thinning	#	204	54	3	4	3	0	268
	Row %	76.12	20.15	1.12	1.49	1.12	0.00	7.97
	Column %	11.51	7.59	0.43	4.71	3.90	0.00	
	Total %	6.07	1.61	0.09	0.12	0.09	0.00	
Shatter	#	52	34	54	7	4	2	153
	Row %	33.99	22.22	35.29	4.58	2.61	1.31	4.55
	Column %	2.93	4.78	7.75	8.24	5.19	10.00	
	Total %	1.55	1.01	1.61	0.21	0.12	0.06	
Tested Material	#	7	4	4	1	1	0	17
	Row %	41.18	23.53	23.53	5.88	5.88	0.00	0.51
	Column %	0.39	0.56	0.57	1.18	1.30	0.00	
	Total %	0.21	0.12	0.12	0.03	0.03	0.00	
Total	#	1773	711	697	85	77	20	3363
	%	52.72	21.14	20.73	2.53	2.29	0.59	100.00

material type is slightly different from that for the total. Quartzite has a higher percentage of tertiary flakes than translucent algalitic chert, which has more secondary flakes. This may be due to differences in the size and shape of the original cobbles.

Other Artifacts

Twelve pieces of groundstone and a stone bead were recovered from Component IV deposits (Appendix B). The component lacked hammerstone. The groundstone implements include a shaped mano, two unshaped slab metates, and nine indeterminate groundstone fragments. The shaped mano is unifacially ground and pecked, one slab metate is unifacially ground and pecked, and the other is only ground. The one stone bead from the component is 10.5 mm in diameter, 2.1 mm thick, and is made of antiogorite.

A dramatic increase in the frequency of groundstone occurs in the Late Prehistoric Component IV over the earlier Archaic components at the Taliaferro site. A relatively high frequency of groundstone is present in the other Late Prehistoric components as well. In conjunction with the increase of grinding implements, numerous charred seeds of several taxa were recovered from the fill of the features. The evidence indicates that the processing of plant foods was a fairly important activity during the Late Prehistoric period at the site. Among the excavated Late Prehistoric sites in the Wyoming Basin with similar ages as Component IV, Component III at 48SW1242 (Hoefer 1986) and Component II at the Sheehan site (Bower et al. 1986) produced groundstone.

Flat, circular stone beads do occur on other sites dating to the Late Prehistoric period. They are much more common in Late Prehistoric sites on the Colorado Plateau and eastern Great Basin. They occur in Components IV, V, and VI at the Taliaferro site. In the Green River Basin, similar stone beads have been found at the Austin Wash site (Schroedl 1985) and the Wardell Buffalo Trap (Frison 1973).

Plant Macrofossils

Samples of fill from the nine pit features were floated and examined for plant macrofossils (Appendix C). A total of 1910 charred seeds was recovered with each feature yielding some seeds (Table 15). Goosefoot (Chenopodium sp.) was the predominate taxon in each of the features. Beeweed (Cleome sp.) dominates the plant macrofossil collection from Feature 26, a medium basin, and was present in small quantities in four other features. By far, Feature 15, an oxidized basin, contained the most charred seeds for the component, including 892 goosefoot and 121 Cruciferae (mustard family). Cruciferae seeds are the second most common taxon from the component and occurred in a total of five features. All but two of the features produced charred saltbush (Atriplex sp.) seeds. The next most important taxon in the collection is sedge (Carex sp.) which was found in six features. Monolepis (Monolepis nuttallina) and sunflower (Helianthus sp.) seeds were present in small quantities in four and three features respectively. Other taxa identified for Component IV include greasewood (Sarcobatus vermiculatus), strawberry (Fragaria sp.), mint (Mentha sp.), poverty sumpweed (Iva axillaris), Indian ricegrass (Oryzopsis hymenoides), an unidentified grass (Gramineae), and an unknown taxon. The mint and strawberry seeds from this component are the only seeds from these plants recovered at the site.

The 14 different taxa represented in the plant macrofossil collection from Component IV indicate that the prehistoric inhabitants gathered seeds from a wide range of habitats in the site vicinity. Several, including goosefoot, beeweed, monolepis, and sunflower, are weedy species that invade recently disturbed areas. Of these species, only goosefoot presently occurs in dense stands in the site area. It was observed on the recently disturbed playa surface. The other weedy species, as well as goosefoot, probably thrived in areas that were disturbed either intentionally or accidentally by humans.

Seeds of other taxa, such as sedge and mint and possibly strawberry, could have been obtained from the riparian community along Slate Creek. Nebraska sedge (C. nebraskensis) and field mint (M. arvensis) now grow in this community. The ridge top, where the Taliaferro site is situated, supports spiny hopsage (Atriplex spinosa), Indian ricegrass (Oryzopsis hymenoides), and flaxleaf hedge mustard (Schoenocrambe linifolia) which may have provided seeds. Greasewood (Sarcobatus vericulatus) occurs on the Slate Creek floodplain and in the playa area. Strawberry is one plant represented in the collection that may not have been available in the immediate site vicinity because of low precipitation, but it could have been obtained in the nearby foothills.

Table 15. Summary of plant macrofossils recovered from Component IV, Taliaferro site.

Feature No.	Volume of Sample (liter)	Percent[a]	Number of Charred Seeds	Plant Taxon (in order of greatest frequencies)
5	2.5	33	14	Goosefoot, saltbush, monolepis, beeweed, Indian rice-grass
6	2.5	38	4	Strawberry, goosefoot, monolepis
7	2.5	7	22	Saltbush, goosefoot, monolepis, beeweed, sedge, sunflower
15	5.0	23	1136	Goosefoot, mustard family, saltbush, sedge, greasewood, sunflower, mint
16	8.5	7	163	Goosefoot, mustard family, saltbush, sunflower, monolepis, beeweed, unknown, sedge, grass family
17	2.5	13	258	Goosefoot, mustard family, saltbush, sedge
18	2.5	63	79	Goosefoot, mustard family, saltbush, greasewood, sedge, beeweed
26	7.5	29	229	Beeweed, goosefoot, saltbush, mustard family, sedge, sumpweed
27	2.5	83	5	Goosefoot

[a]Percent examined of total feature volume

of several different taxa were collected and processed together at the site. The seeds from most of these taxa are available in the late summer and fall, around August and September, suggesting an occupation for the component, at least, during this time of year. According to the ethnographic and historic literature, the late summer and fall was when seeds were gathered for winter stores (Appendix C).

Pollen

Eight samples from feature fill or from occupation floors around features were processed and counted for pollen (Appendix D). The pit features examined were Feature 6 (an oxidized basin), Feature 7 (a large basin), Feature 15 (an oxidized basin), Feature 17 (a medium basin), and Feature 26 (a medium basin). Features 6 and 7 were part of one multiple feature group, and Features 15 and 17 were associated with another group. Three samples from the occupation floor in the area of Features 5, 6, and 7 were also analyzed.

The high percentage of Cheno-am (goosefoot and amaranth families) pollen, along with aggregates from Feature 6, suggests that goosefoot or some other member of the goosefoot family was processed in the vicinity of the oxidized basin. A few goosefoot and monolepis seeds were also recovered from Feature 6, which further indicates that the processing of Cheno-am was an important activity. Though saltbush, goosefoot, and monolepis were present in Feature 7, the feature has one of the lowest Cheno-am pollen frequencies of the samples from the component. Feature 7, however, had the highest percentage of High-spine Compositae pollen for the component. Sunflower seeds, a High-spine

Compositae, are part of the plant macrofossil assemblage of the feature. This indicates these seeds were processed in the vicinity. Additionally, the sample from Feature 7, which also produced sedge seeds, was the only one with Cyperaceae (Sedge family) pollen.

Of the samples from the occupation floor, the one taken from between Features 5 and 6 has a high percentage of Cheno-am pollen with aggregates, indicating that a taxon in the goosefoot family was processed or grew in the area. Another occupation floor sample located just east of Feature 6 contains the highest frequency of sagebrush (Artemisia sp.) pollen with aggregates; this perhaps reflects the stacking of sagebrush near the feature for fuel. Sagebrush may also have been stacked near Feature 7, as indicated by a high percentage of sagebrush pollen with aggregates in the floor sample located just north of the feature. Overall, information from the plant macrofossil and microfossil analyses of samples from around and within features in this multiple feature group shows that the processing of plants, especially seeds, was a major activity.

Feature 15, located in the northern portion of the excavation area, produced the highest frequency of Cheno-am pollen with aggregates for the samples from Component IV. This feature also had the most goosefoot seeds for the component, suggesting that intensive plant processing took place in the vicinity of the feature. In addition to Cruciferae (mustard family) seeds, Cruciferae pollen was present in Feature 15, indicating this was one of the taxa processed in the area. Another feature associated with Feature 15, Feature 17, had a fairly high percentage of Cheno-am pollen and contained generally the same taxa of charred seeds, though fewer in number, as Feature 15. Feature 26, located to the west of the others had a slightly lower percentage of Cheno-am pollen than the other features in this portion of the excavation area. The feature, however, contained the only beeweed (Cleome sp.) pollen for the site. Beeweed seeds are also the dominant plant macrofossil in the feature, which suggests that this plant was intensively processed in the vicinity.

This evidence of intensive plant gathering and processing, especially seeds, during Component IV times contrasts with the meager data from the earlier Archaeic period components. During the Archaic periods, the processing of roots or seeds was only a minor activity at the Taliaferro site; but by the Late Prehistoric period, the collection and preparation of seeds of several taxa was a major endeavor.

Animal Remains

A total of 197 specimens of bone, teeth, and shell was recovered from Component IV (Appendix E). Table 16 presents the number of specimens and the minimum number of individuals by taxon or analytical group. Along with Component VI, this component has the most variety of taxa represented for the site. Ten taxa were identified, including large and small mammals, bird, fish, and mussel. Bison is represented by a molar and a ulna shaft fragment, and pronghorn by a distal humerus fragment, a scaphoid, and a first phalange fragment. The anatomical elements of the jackrabbit specimens include frontal, temporal, vertebra, humerus, ulna, femur, tibia, and phalange fragments. The one cottontail bone is a humerus shaft fragment, and a scapula and ulna fragment were identified to muskrat. A burned maxilla fragment of a ground squirrel and a portion of a burned mandible of a vole also were recovered. A ulna shaft fragment was identified as sage grouse, and a vertebra is from a sucker. The 15 specimens grouped into the Artiodactyl category belong to a pronghorn- or deer-sized animal and consist of limb

Table 16. Animal remains by taxon, Component IV, Taliaferro site.

Taxon	N	MNI
Bison (Bison bison bison)	2	1
Pronghorn (Antilocapra americana)	3	1
Jackrabbit (Lepus sp.)	13	2
Cottontail (Sylvilagus sp.)	1	1
Muskrat (Ondatra zibethicus)	2	1
Ground squirrel (Spermophilus sp.)	1	1
Vole (Microtus sp.)	1	1
Sage grouse (Centrocercus urophasianus)	1	1
Sucker (Catostomus sp.)	1	1
Artiodactyl	15	-
Large mammal	40	-
Medium to large mammal	36	-
Medium mammal	12	-
Small to medium mammal	14	-
Small mammal	53	-
Mussel shell (Margaritifera sp.)	2	-
Total	197	-

Key: N = number of identified specimens
MNI = minimum number of individuals

extremities. The remaining specimens, 79% of the collection, are unidentifiable fragments.

In contrast to the Late Archaic Component III, there is almost an equal representation of specimens from large and small animals in the collection for this component. The large animals, bison and pronghorn, are similar to those exploited during the Late Archaic period, except most Artiodactyl specimens in Component IV are from pronghorn or are unidentified specimens of that size. Most of the identified small animal remains are from jackrabbit. Overall, a wide variety of animal species was exploited during Component IV times, including those from upland and riparian environments. The larger game probably was obtained at some distance from the site, and only selected pieces were brought back for further processing. Most recovered anatomical elements of these larger animals are portions of hind quarters and distal extremities of the limbs. The muskrat, sucker, and mussels probably were acquired from the Green River, 7 km east of the site, or possibly from Slate Creek a few meters north of the site.

As with the other components at the Taliaferro site, the majority of the recovered bone in Component IV are unidentifiable fragments. This suggests maximum use of animals. The large animals were probably processed for their marrow, grease, and juice as well as for meat. Only 54 of the 197 specimens displayed evidence of burning. Freshwater mussels are accessible for collection between spring and fall in the site area, which suggests an occupation for the site during these seasons.

Other excavated sites in southwest Wyoming with Late Prehistoric components of similar age as that of Component IV at the Taliaferro site include 48SW1242 (Hoefer 1986) and the Sheehan site (Bower et al. 1986). As with Component IV, these sites produced specimens representing a wide variety of taxa. Component III at 48SW1242, dating to 1550 years ago, contained remains of bison, mule deer, pronghorn, carnivore, jackrabbit, cottontail, rodent, owl, goose, sage grouse, and amphibian. The cultural association of the carnivore, owl, and amphibian is unknown. Remains of elk, mountain sheep, mule deer, white-tailed deer, pronghorn, porcupine, jackrabbit, cottontail, and striped skunk were recovered from Component II at the Sheehan site. In contrast to these sites, the Wardell Buffalo Trap, with a date of 1580 years ago from the bottom of the kill area, yielded predominately bison remains.

Spatial Distribution of Remains

The spatial distribution of features, fire-cracked rock, flaked stone artifacts, groundstone, debitage, and bone was plotted for Component IV. The relationships of these remains provide some clues about the type and location of the activities conducted at the site. Interpretations concerning the activities conducted around the northern multiple feature group based on the spatial relationships of the debris are provided in Chapter 5.

The distribution of the features and fire-cracked rocks is shown in Figure 46. The multiple feature group, consisting of Features 5, 6, and 7, is located in the southern portion of the excavation area; and the other group is in the northern part. Most of the fire-cracked rock and other features occur in one of these areas. Though the lack of material in the center of the area may be in part due to excavation methods, the overall distribution of the remains is probably the result of past cultural activities.

Figure 47 shows the distribution of the flaked stone artifacts and groundstone. The density values by square meter for all flaked stone artifacts across the excavation area were smoothed using trend surface analysis (Hodder and Orton 1976:155). The trend surface map indicates that the dense areas occur in the northern and southern portions of the excavation block, which corresponds to the location of the features and fire-cracked rock.

Individual maps were made showing the number per square meter of projectile points, bifaces, retouched and utilized flakes, cores, and groundstone. Insufficient quantities of these artifact types precluded the use of trend surface analysis. The majority of the projectile points occur in the northern portion of the area in the vicinity of a multiple feature group. The bifaces are scattered throughout, but their distribution generally follows the pattern for all flaked stone artifacts. Retouched and utilized flakes were found mostly in the southern portion, and the one core came from the northern part of the excavation area. Groundstone is associated with both multiple feature groups.

Figure 48 provides trend surface density maps for total debitage and individual maps for the various material types. The most dense area for total debitage is in the northern portion of the excavation area and is associated with a multiple feature. A density peak for all flaked stone artifacts also occurs in this area. A slightly less dense area of total debitage occurs in the southern portion next to the other multiple feature group.

The individual trend surface maps of the various material types indicate that debitage of translucent and opaque algalitic chert occur primarily in the northern portion of the excavation area. This pattern is similar to total debitage and all flaked stone artifacts. Quartzite debitage is common in both the northern and southern halfs, as is Whiskey Buttes chert. Obsidian debitage is most dense in the northern portion.

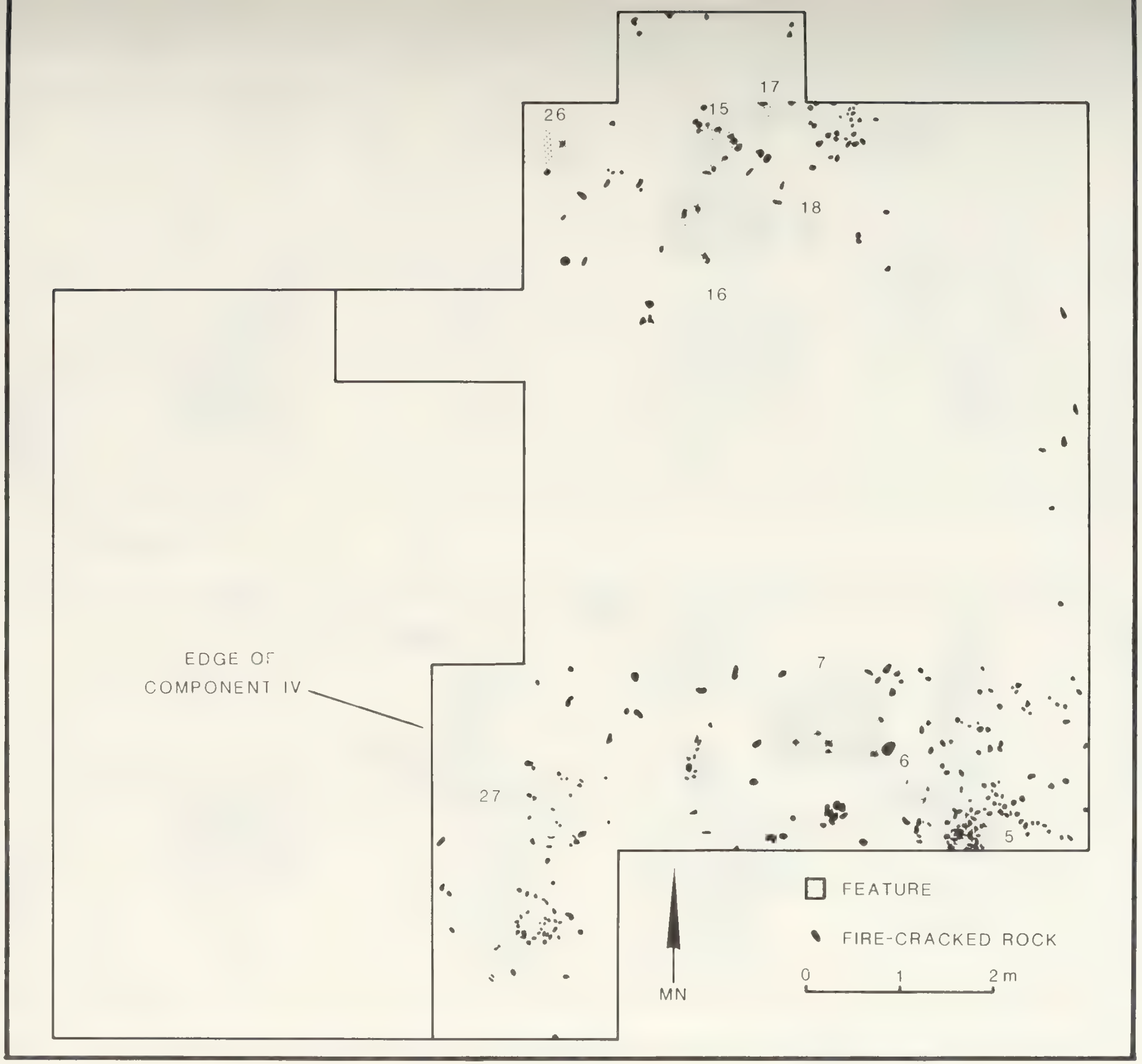


Figure 46. Plan map of Excavation Area B showing distribution of features and fire-cracked rock, Component IV, Taliaferro site.

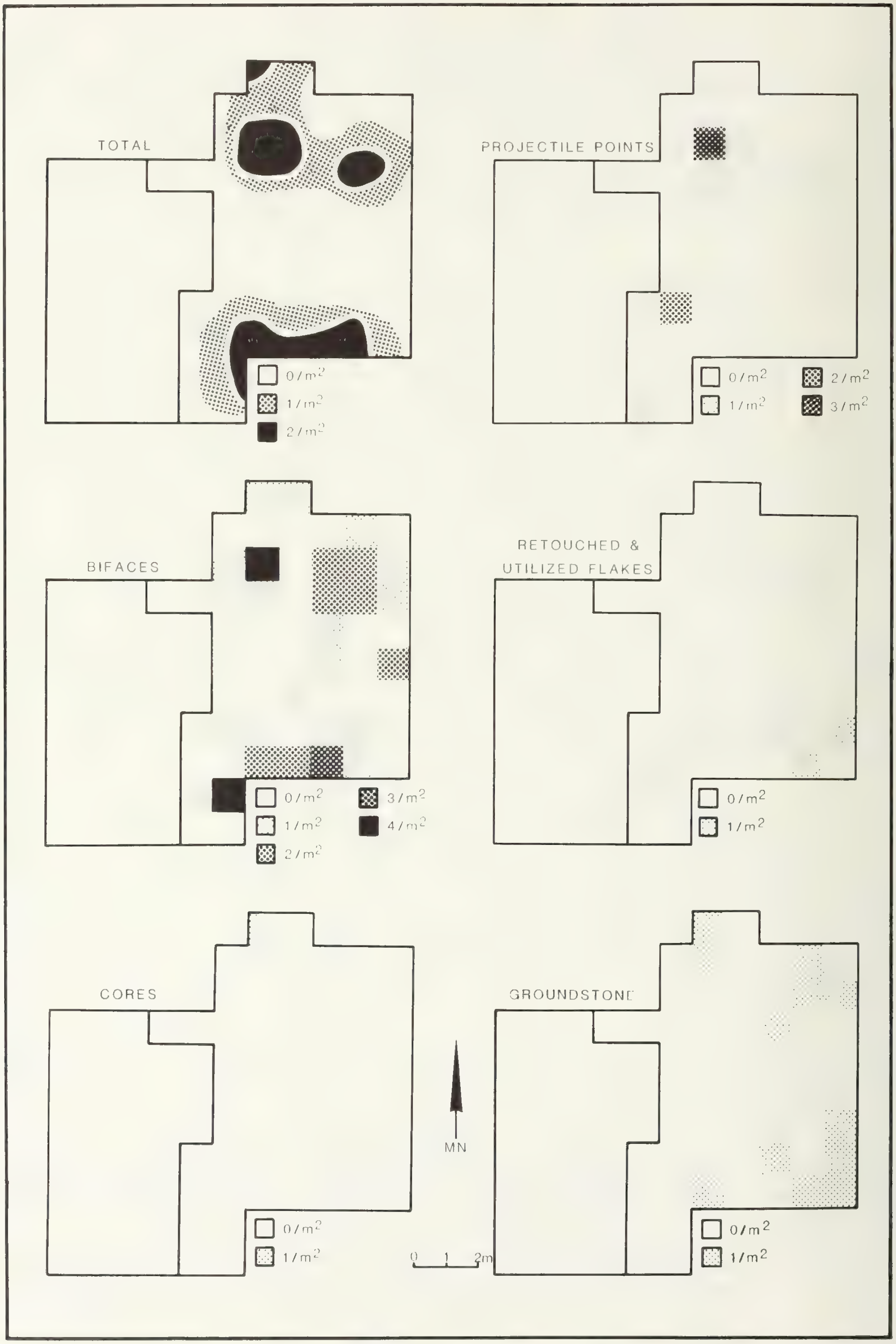


Figure 47. Plan maps of Excavation Area B showing the horizontal distribution of all flaked stone amd groundstone tools, Component IV, Taliaferro site.

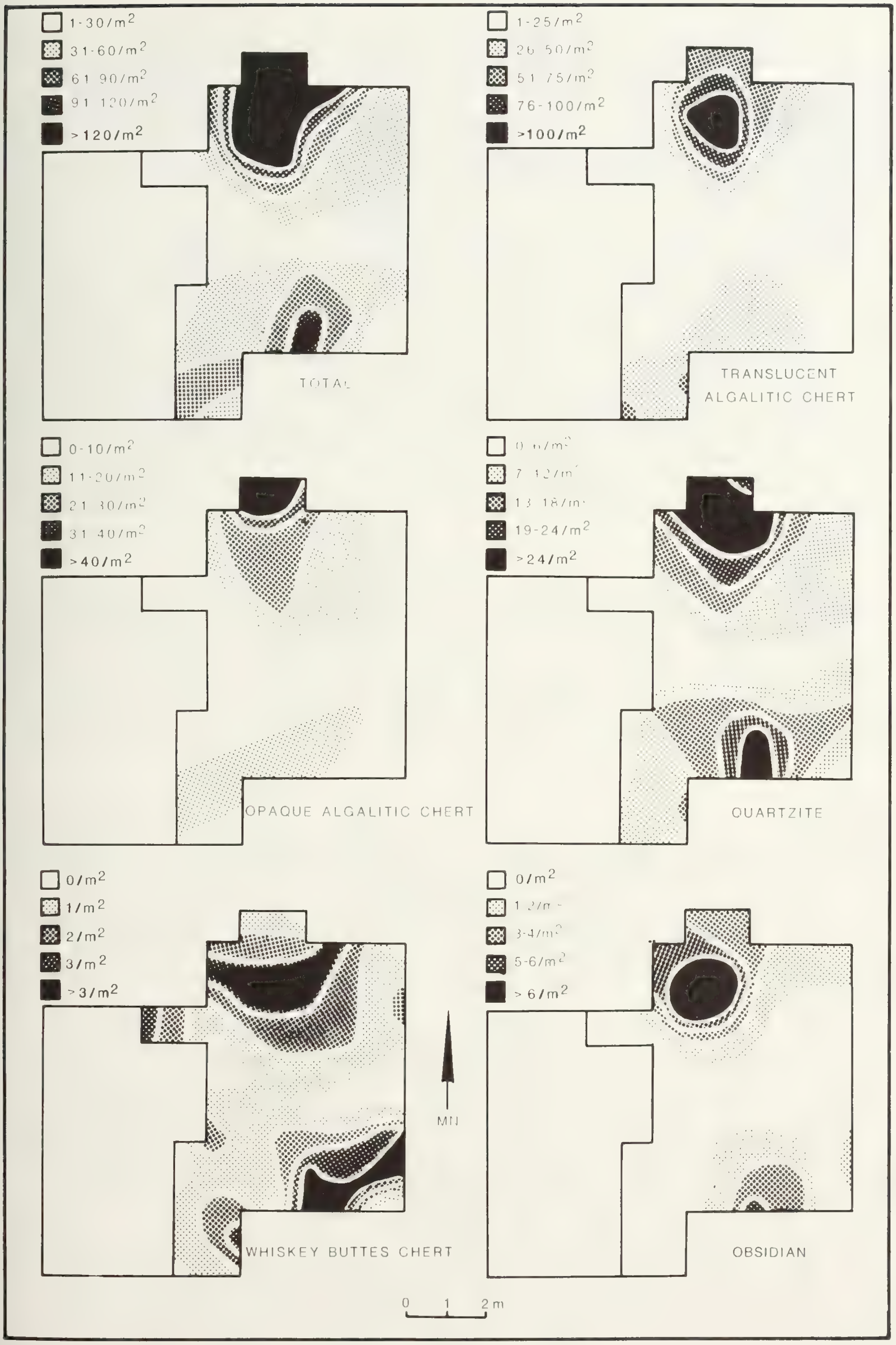


Figure 48. Plan maps of Excavation Area B showing the horizontal distribution of total debitage and material types, Component IV, Taliaferro site.

The distribution of bone is shown in Figure 49. Individual trend surface maps were made for the number and weight of bone per square meter. The density peak on the trend surface map for number of specimens occurs in the northern portion of the excavation area. This roughly corresponds to the northern multiple feature group and the distribution of all flaked stone artifacts and total debitage. The map for weight is fairly similar to the one for number, except there is another density peak in the southwest corner of the excavation area.

The density maps broken down to number of each faunal taxa per square meter show that most of the Artiodactyl remains, including pronghorn and bison, are concentrated in the northern half, as are the unidentifiable large mammal remains. Remains of rabbit, muskrat, ground squirrel, sage grouse, and mussel shell were recovered from the northern portion. Most of the unidentifiable small mammal remains also came from the northern portion.

Overall, a concentration of cultural remains is associated with each of the multiple feature groups; one group of features is in the northern portion of the excavation area and the other is in the southern part. Debitage and bone are most common around the northern group. Bifaces and groundstone occur with both, and most of the retouched and utilized flakes are scattered around the southern group. Little material was found between the feature groups.

Component V

The Late Prehistoric Component V occurs throughout Excavation Area B just above Component IV. For most of the excavation block, a layer of fire-cracked rock in the center of the midden deposits marks the component. A charcoal sample from Feature 14 was radiocarbon dated at 1310 years ago. Some cultural material may be mixed with Components IV and VII, but this probably does not affect the overall interpretations. A total of 92 m² was excavated in this component.

Features

Six pit features were present in Component V (Table 17). These included two bell-shaped pits, Features 9 and 12; two irregular-shaped pits, Features 4 and 24; a rock-filled basin, Feature 14; and a small basin, Feature 10. A complete description of these morphological types is provided in Appendix A. The only two bell-shaped pits found at the Taliaferro site belong to this component, and they were about 2 m apart. Feature 9 was relatively large, measuring 70 cm in diameter and 20 cm deep; and Feature 12 was fairly small, measuring 28 x 25 x 17 cm.

Feature 9 contained dark sediment with large amounts of charcoal, some bone and debitage, and five taxa of charred seeds. A metapodial fragment from a juvenile deer or pronghorn, mammal bone wall fragments, and pieces of egg shell are among the recovered animal remains. Goosefoot (Chenopodium sp.) was the dominant taxon of charred seeds. Feature 9 is illustrated in Figure 50. The other bell-shaped pit, Feature 12, had contents similar to Feature 9. The identified bone includes medium to large mammal tooth enamel fragments and bone fragments from small and large mammals.

The two irregular-shaped pits, Features 4 and 24, exhibited oxidation on the bottom and were characterized by an irregular plan view and shallow cross section. Both had dark sediment with large amounts of charcoal. Feature 24 yielded debitage, six taxa of charred seeds, and small mammal bone fragments. Feature 4 lacked these remains, but its fill was not examined for plant macrofossils.

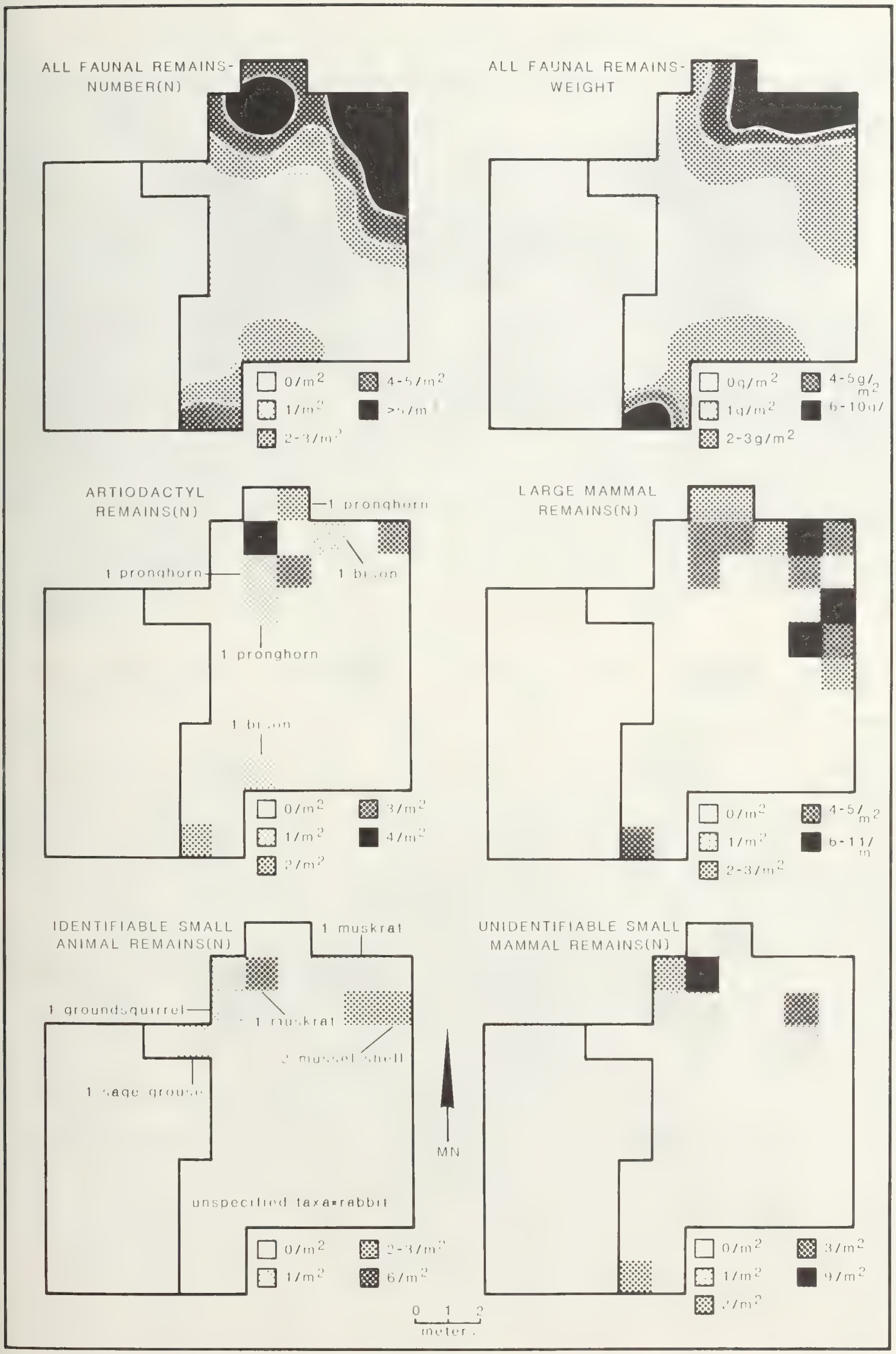


Figure 49. Plan maps of Excavation Area B showing the horizontal distribution of animal remains, Component IV, Taliaferro site.

Table 17. Characteristics of pit features, Component V, Taliaferro site.

Feature No.	Type	Volume (liter)	Area (cm^2)	Artifacts	Debitage (total)	Bone No.	Bone wt.(g)	Plant Macrofossil[a]	Charcoal[b]
4	Irregular-shaped	8.0	1590.0	-	-	-	-	-	much
9	Bell-shaped	51.0	3848.0	Preform fragment	103	20	5.8	5	much
10	Small basin	8.5	1590.0	-	9	9	3.4	5	much
12	Bell-shaped	6.0	551.5	-	13	7	1.1	3	much
14	Rock-filled basin	17.0	1520.5	Slab metate, Stone bead	13	7	0.7	7	much
24	Irregular-shaped	3.0	881.5	-	37	6	0.1	6	much

[a]Number of taxa

[b]Relative amount

Feature 14 was a rock-filled basin containing 69 fire-cracked quartzite cobbles concentrated in a single layer (Figure 51). About 1 cm of dark sediment separated the rocks from the bottom of the pit. The fill above and surrounding the rocks was extremely dark and contained large chunks of charcoal. An oxidation ring was present around the sides, which was most noticeable along the southwestern edge. A slab metate fragment was collected from within the fire-cracked rock concentration. Also recovered from the fill were seven taxa of charred seeds, debitage, a stone bead, and bone fragments of rabbit (Sylvilagus sp.) and unidentifiable small mammals. Charred seeds of beeweed (Cleome sp.) dominated the plant macrofossil collection from the feature.

The remaining pit feature associated with Component V was a small basin, Feature 10. It was located about 2 m from Feature 9, the large, bell-shaped pit (Figure 50). The feature was classified as a small basin because of small volume and the absence of fire-cracked rock or oxidation. The fill consisted of a dark sediment with charcoal, debitage, five taxa of charred seeds, and bone fragments. A metapodial fragment from a juvenile deer or pronghorn, small mammal rib fragments, and unidentifiable large mammal fragments were among the recovered bone.

Because charred seeds, bone, charcoal, and debitage were present in the two bell-shaped pits, they probably served multiple functions. They may have been roasting pits where heated rocks and charcoal were used to cook plant or animal foods. Following the roasting activities, refuse, including bone and debitage, most likely was dumped into the pits. The irregular-shaped pits probably functioned as firepits as indicated by the presence of oxidation and charcoal. The rock-filled basin, Feature 14, containing rocks, charcoal, and oxidation, was used to heat rocks, possibly for use in the roasting pits, or it may have been an oven pit where animals, such as rabbits, were roasted.

Figure 50. Feature 9, a bell-shaped pit (left), and Feature 10, a small basin (right), Component V, Taliaferro site.

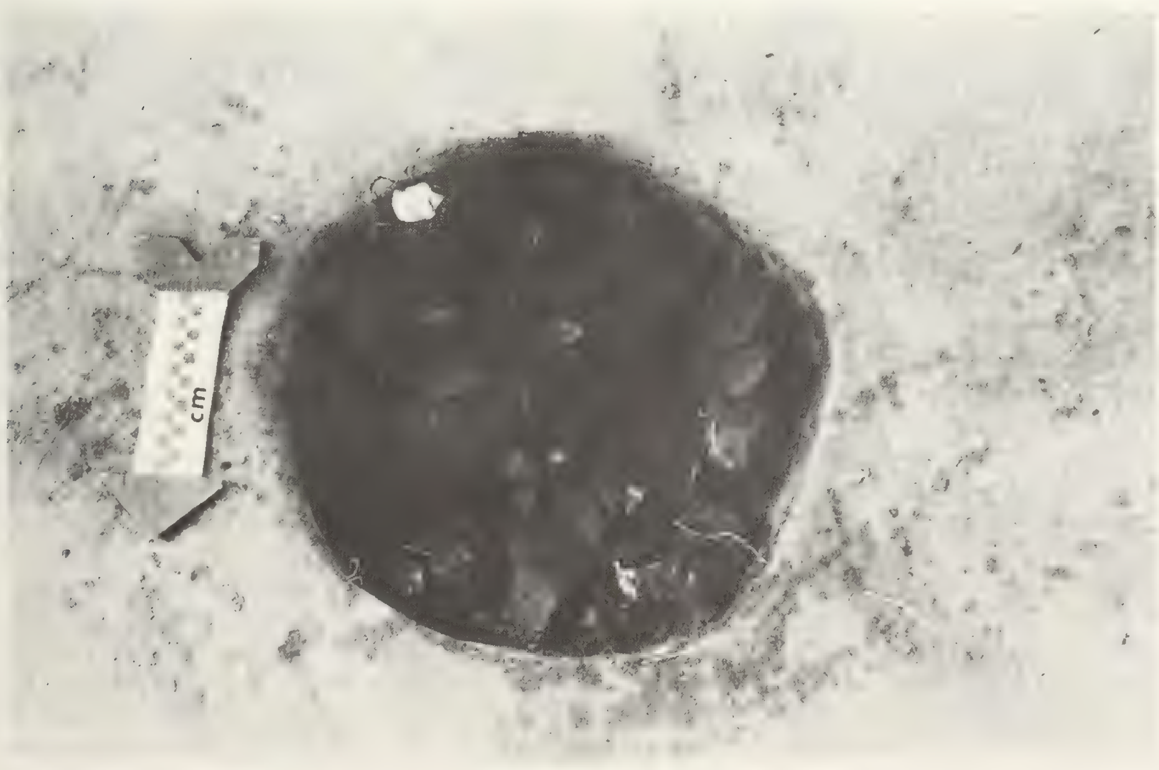


Figure 51. Feature 14, a rock-filled basin, showing rocks in place, Component V, Taliaferro site.

oxidation, was used to heat rocks, possibly for use in the roasting pits, or it may have been an oven pit where animals, such as rabbits, were roasted. The small basin, which lacked evidence of in-place burning, may have been a trash dump.

The recovery of charred seeds of several taxa and bone fragments from most Component V pit features indicates that the processing of seeds and the consumption of some meat were important activities. The seeds, especially those of Chenopodium and Cleome, probably were incorporated accidentally into the features during the threshing, winnowing, and parching tasks that occurred in the areas surrounding the pits.

Flaked Stone Artifacts

A total of 158 flaked stone tools and 7615 pieces of debitage was recovered from Component V deposits. They include 18 projectile points, 2 drills, 10 final biface tips, 72 preforms or fragments, 9 blanks, 15 preblanks, 9 indeterminate bifaces, 6 retouched flakes, 10 utilized flakes, a modified cobble, and 6 cores (Table 18). An example of flaked stone tool types belonging to Component V is provided in Figure 52.

The projectile points associated with Component V were assigned to Type I large, bifurcate-stemmed; small, corner-notched; and small, side-notched. The one Type I large, bifurcate-stemmed point from Component V is probably out of place and most likely originated from the Middle Archaic Component II. This point may have been picked up for reuse. Normally these points date between 5000 and 3000 years ago.

Fifteen small, corner-notched points were recovered; eight are of translucent algalitic chert, three are of opaque algalitic chert, three are of obsidian, and one is of quartzite. These points are common in all the assemblages from the Late Prehistoric components at the Taliaferro site. Besides those from Component V, another 57 are present in the Late Prehistoric Components IV, VI, and VIII. The small, corner-notched points from the Taliaferro site date between 1500 and 960 years ago, which is consistent with their age in nearby regions. Other sites in southwest Wyoming of similar age as Component V that contain Rose Spring points include Component IV (1280 years B.P.) at Cow Hollow Creek (Schock et al. 1982) and Austin Wash with ages ranging from 1370 to 1070 years ago (Schroedl 1985).

Two small, side-notched points are associated with Component V. Others are from the Late Prehistoric Components VI, VII, and VIII. The two from Component V resemble the Uinta Side-notched type that are common at Fremont sites dating between 1150 and 750 years ago (Holmer and Weder 1980). They also are similar to the Prairie Side-notched type with an age of about 1250 to 650 years ago on the northern Great Plains (Kehoe 1966). In southwest Wyoming, small, side-notched points are the most common point type at the Wardell Buffalo Trap (Frison 1973). A similar point was identified from Component IV (1140 years B.P.) at the Maxon Ranch site (Harrell and McKern 1986). The age of the two point types from Component V at the Taliaferro site corresponds to the early portion of the temporal span for these points in the region.

The two drills from Component V are of translucent and opaque algalitic chert. One has an expanding rounded base, and the other has a convex base without a pronounced expansion. Both are incomplete and lack tips. In southwest Wyoming, a similar rounded base drill was recovered from Component II at the Sheehan site with radiocarbon ages of 1440 and 1190 years ago (Bower et al. 1986). The ten final biface tips are probably distal portions of projectile points.

Table 18. Crosstabulation of flake stone type by material type, Component V, Taliaferro site.

Artifact Type		Material Type: Translucent Chert	Opaque Chert	Quartzite	Whiskey Buttes Chert	Obsidian	Total
Bifurcate-Stemmed Point, Type I	#	1	0	0	0	0	1
	Row %	100.0	0	0	0	0	0.6
	Column %	1.1	0	0	0	0	
	Total %	0.6	0	0	0	0	
Small, Corner-Notched Point	#	8	3	1	0	3	15
	Row %	53.3	20.0	6.7	0	20.0	9.5
	Column %	8.7	8.8	4.8	0	75.0	
	Total %	5.1	1.9	0.6	0	1.9	
Small, Side-Notched Point	#	2	0	0	0	0	2
	Row %	100.0	0	0	0	0	1.3
	Column %	2.2	0	0	0	0	
	Total %	1.3	0	0	0	0	
Drill	#	1	1	0	0	0	2
	Row %	50.0	50.0	0	0	0	1.3
	Column %	1.1	2.9	0	0	0	
	Total %	0.6	0.6	0	0	0	
Final Biface Tip	#	8	2	0	0	0	10
	Row %	80.0	20.0	0	0	0	6.3
	Column %	8.7	5.9	0	0	0	
	Total %	5.1	1.3	0	0	0	
Large Preform	#	0	2	3	0	0	5
	Row %	0	40.0	60.0	0	0	3.2
	Column %	0	5.9	14.3	0	0	
	Total %	0	1.3	1.9	0	0	
Small Preform, Type IIa	#	2	0	0	0	0	2
	Row %	100.0	0	0	0	0	1.3
	Column %	2.2	0	0	0	0	
	Total %	1.3	0	0	0	0	
Small Preform, Type IIb	#	1	0	0	0	0	1
	Row %	100.0	0	0	0	0	0.6
	Column %	1.1	0	0	0	0	
	Total %	0.6	0	0	0	0	
Small Preform, Type III	#	1	1	0	0	0	2
	Row %	50.0	50.0	0	0	0	1.3
	Column %	1.1	2.9	0	0	0	
	Total %	0.6	0.6	0	0	0	
Preform Fragment	#	39	14	4	5	0	62
	Row %	63.0	22.6	6.5	8.1	0	39.2
	Column %	42.4	41.2	19.1	71.4	0	
	Total %	24.7	8.9	2.5	3.2	0	
Blank	#	4	3	2	0	0	9
	Row %	44.4	33.3	22.2	0	0	5.7
	Column %	4.3	8.8	9.5	0	0	
	Total %	2.5	1.9	1.3	0	0	
Preblank	#	10	2	2	1	0	15
	Row %	66.7	13.3	13.3	6.7	0	9.5
	Column %	10.9	5.9	9.5	14.3	0	
	Total %	6.3	1.3	1.3	0.6	0	

Table 18. Concluded.

Artifact Type		Material Type: Trans-lucent Chert	Opaque Chert	Quartzite	Whiskey Buttes Chert	Obsidian	Total
Indeterminate Biface	#	6	3	0	0	0	9
	Row %	66.7	33.3	0	0	0	5.7
	Column %	6.5	8.8	0	0	0	
	Total %	3.8	1.9	0	0	0	
Distal Retouched Flake, Type III	#	0	0	1	0	0	1
	Row %	0	0	100.0	0	0	0.6
	Column %	0	0	4.8	0	0	
	Total %	0	0	0.6	0	0	
Lateral Retouched Flake, Type I	#	0	0	1	0	0	1
	Row %	0	0	100.0	0	0	0.6
	Column %	0	0	4.8	0	0	
	Total %	0	0	0.6	0	0	
Irregular Retouched Flake	#	2	1	0	0	1	4
	Row %	50.0	25.0	0	0	25.0	2.5
	Column %	2.2	2.9	0	0	25.0	
	Total %	1.3	0.6	0	0	0.6	
Utilized Flake	#	6	1	2	1	0	10
	Row %	60.0	10.0	20.0	10.0	0	6.3
	Column %	6.5	2.9	9.5	14.3	0	
	Total %	3.8	0.6	1.3	0.6	0	
Modified Cobble	#	0	0	1	0	0	1
	Row %	0	0	100.0	0	0	0.6
	Column %	0	0	4.8	0	0	
	Total %	0	0	0.6	0	0	
Residual Core	#	1	0	3	0	0	4
	Row %	25.0	0	75.0	0	0	2.5
	Column %	1.1	0	14.3	0	0	
	Total %	0.6	0	1.9	0	0	
Multidirectional Core	#	0	1	0	0	0	1
	Row %	0	100.0	0	0	0	0.6
	Column %	0	2.9	0	0	0	
	Total %	0	0.6	0	0	0	
Discodial Core	#	0	0	1	0	0	1
	Row %	0	0	100.0	0	0	0.6
	Column %	0	0	4.8	0	0	
	Total %	0	0	0.6	0	0	
Total	#	92	34	21	7	4	158
	%	58.2	21.5	13.3	4.4	2.5	100.0

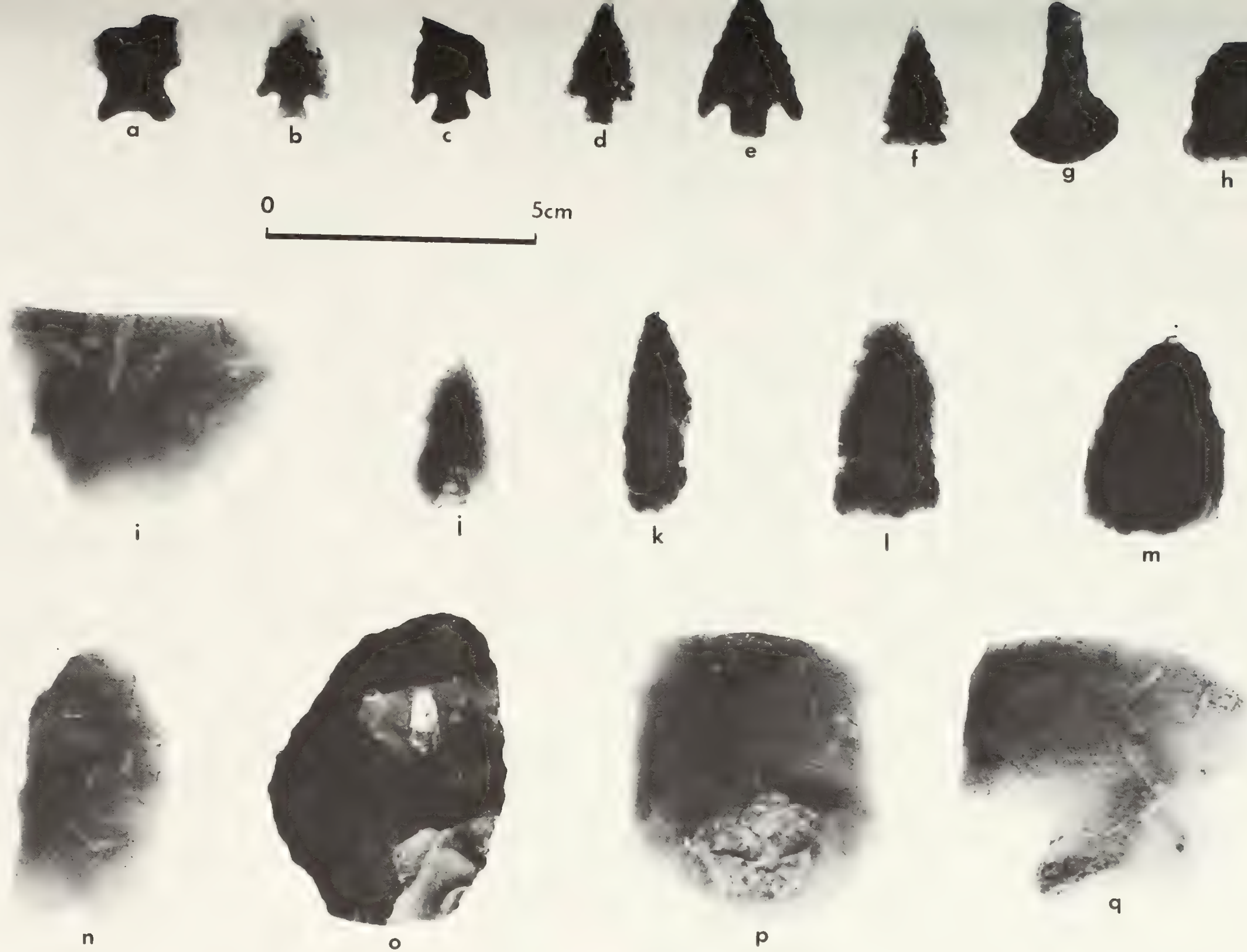


Figure 52. Example of flaked stone artifact assemblage from Component V, Taliaferro site. a, Large, bifurcate-stemmed projectile point, Type I; b-e, Small corner-notched projectile points; f, Small, side-notched projectile point; g-h, Drill; i, Large preform; j-k, Small preform, Type IIa; l, Small preform, Type IIb; m, Small preform, Type III; n, Blank; o, Preblank; p, Distal retouched flake, Type III; q, Lateral retouched flake, Type I.

Of the five large preforms, three are of quartzite and two are of opaque algalitic chert. The remaining five identifiable preforms are small preform Types IIa, IIb, and III. They are part of the flake stone artifact assemblages of the Late Archaic Component III and the Late Prehistoric Components IV-VII. The Type III small preforms have wider bases than Types IIa and IIb and are generally thicker than the other small preforms. They belong solely to the Late Prehistoric Components V and VI. By far, most (62) of the recovered preforms are fragments. Preform fragments make up 39.2% of the total number of flaked stone artifacts for the component. Similar preforms were found at the Austin Wash site dating between 1370 and 1070 years ago and located in the Green River Basin (Schroedl 1985).

The nine blanks are of translucent and opaque algaltic chert and quartzite. This distribution of material types contrasts with that of the preforms and projectile points for Component V, which are predominently of translucent algalitic chert. The 15 preblanks are mostly of translucent algalitic chert, which is consistent with most flaked stone artifacts for the component. The nine indeterminate bifaces are of translucent and opaque algalitic chert.

The nine retouched flakes consist of a Type III distal retouched, a Type I lateral retouched, and four irregular retouched flakes. The Type III flakes are the largest of the three distal retouched types. Both Type III distal retouched and Type I lateral retouched flakes occur in most components at the Taliaferro site. Distal and lateral retouched flakes also are present at other Late Prehistoric sites in the area, including the Austin Wash site dating between 1370 and 1070 years ago (Schroedl 1985). The four irregular retouched flakes are of translucent and opaque algalitic chert and obsidian.

Most of the ten utilized flakes are of translucent algalitic chert, and a few are distributed among the other material types. One modified quartzite cobble also was recovered. Of the six cores, four are residual, one is multidirectional, and one is discodial. The discoidal core is the only one identified at the site.

As with most components at the Taliaferro site, bifacial reduction was the favored technique for flaked stone implement production during Component V times. The recovery of preblanks, blanks, preforms, and formal tools indicates that all stages in the bifacial reduction sequence were performed at the site. The retouching of flakes into tools and the expedient modification of cobbles and pebbles were less represented activities. As noted above, most of the preforms are incomplete and probably were broken and rejected during manufacture. Figure 53 illustrates the horizontal distribution of the broken artifacts that were refitted.

The majority (58.2%) of the flaked stone artifacts are of translucent algalitic chert, and the next most common material type is opaque algalitic chert. The heavy reliance on algalitic chert for toolstone during the Late Prehistoric Component V contrasts with the pattern for the Archaic period components. For the Early Archaic Component I, quartzite was the favored material type, and the artifacts are more evenly distributed among the algalitic cherts and quartzite for the Middle and Late Archaic Components II and III. Like Component V, the other Late Prehistoric components are dominated by translucent algalitic chert artifacts.

The crosstabulation of debitage type by material type is detailed in Table 19. Translucent algalitic chert is the dominant material type with 48.0% of the total. There is a slightly higher percentage for opaque algalitic chert (26.4%) than for quartzite (20.6%) debitage. The distribution of material type for the debitage is similar to the frequencies for the flaked

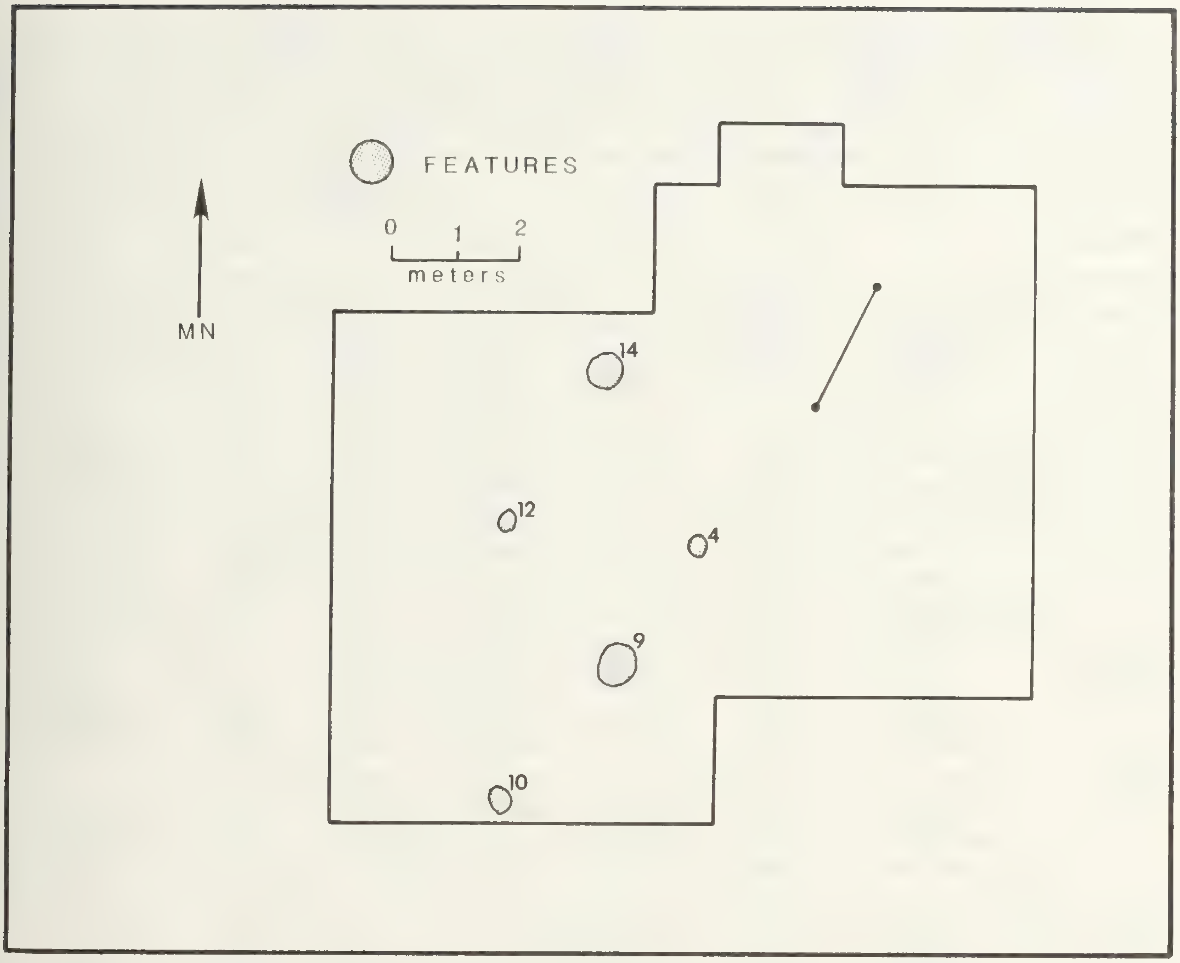


Figure 53. Plan map of Excavation Area B showing the horizontal distribution of the artifact that was refitted, Component V, Taliaferro site.

stone tools, which indicates that artifacts of all material types were entirely manufactured at the site. Premade implements probably were not brought to the site.

The majority of the debitage consists of tertiary flakes accounting for 59.4% of the total. Secondary flakes are represented by 21.2% and primary flakes by 8.9%. As shown in Appendix B, these percentages correspond to the expected ratio of flake types if all stages in the bifacial reduction sequence were performed at the site. This ratio is similar for all components and indicates that the cobbles occurring in the vicinity of the site were completely reduced at the locality. An examination of the percentages of flake types broken down by material type shows that quartzite has a higher percentage of tertiary flakes than translucent algalitic chert, which has more secondary flakes. As noted for other components, this may be due to differences in the size and shape of the original cobbles.

Other Artifacts

Two hammerstones, 11 pieces of groundstone, a stone bead, and a bone bead fragment were recovered from Component V deposits (Appendix B). The hammerstones are incomplete and are of quartzite. The groundstone implements are a shaped mano, a shaped slab metate, an unshaped slab metate, and eight pieces of unclassifiable groundstone. The shaped mano is unifacially ground, the shaped metate is unifacially ground and pecked, and the unshaped metate is

Table 19. Crosstabulation of debitage type by material type, Component V, Taliaferro site.

Flake Type		Material Type						
		Trans-lucent Chert	Opaque Chert	Quartzite	Whiskey Buttes Chert	Obsidian	Other	Total
Primary	#	436	99	109	15	16	0	675
	Row %	64.59	14.67	16.15	2.22	2.37	0.00	8.86
	Column %	11.92	4.92	6.95	7.50	11.68	0.00	
	Total %	5.73	1.30	1.43	0.20	0.21	0.00	
Secondary	#	1054	284	216	30	24	7	1615
	Row %	65.26	17.59	13.37	1.86	1.49	0.43	21.21
	Column %	28.81	14.11	13.78	15.00	17.52	17.95	
	Total %	13.84	3.73	2.84	0.39	0.32	0.09	
Tertiary	#	1797	1397	1084	127	91	30	4526
	Row %	39.70	30.87	23.95	2.81	2.01	0.66	59.44
	Column %	49.13	69.40	69.13	63.50	66.42	76.92	
	Total %	23.60	18.35	14.24	1.67	1.20	0.39	
Bifacial	#	203	88	10	10	2	0	313
Thinning	Row %	64.86	28.12	3.19	3.19	0.64	0.00	4.11
	Column %	5.55	4.37	0.64	5.00	1.46	0.00	
	Total %	2.67	1.16	0.13	0.13	0.03	0.00	
Shatter	#	148	135	144	16	4	2	449
	Row %	32.96	30.07	32.07	3.56	0.89	0.45	5.90
	Column %	4.05	6.71	9.18	8.00	2.92	5.13	
	Total %	1.94	1.77	1.89	0.21	0.05	0.03	
Tested Material	#	20	10	5	2	0	0	37
	Row %	54.05	27.03	13.51	5.41	0.00	0.00	0.49
	Column %	0.55	0.50	0.32	1.00	0.00	0.00	
	Total %	0.26	0.13	0.07	0.03	0.00	0.00	
Total	#	3658	2013	1568	200	137	39	7615
	%	48.04	26.43	20.59	2.63	1.80	0.51	100.00

unifacially pecked. The one stone bead from the component is 3.7 mm in diameter, 0.9 mm thick, and is made of antigorite. The bone bead is a tubular fragment which exhibits evidence of the grove-and-snap method of manufacture.

As with the other Late Prehistoric components at the Taliaferro site, groundstone artifacts are common in Component V. There appears to be little difference in the type and amount of groundstone between these components. Most of the other excavated sites in the Wyoming Basin with similar dates as Component V, 1310 years ago, have at least some groundstone in the artifact assemblage. These include Component III at 48SW1091 (O'Brien 1982), 48CR3472 (Sender et al. 1982), Paradox Ridge site (Gardner et al. 1982), Austin Wash site (Schroedl 1985), and the Oyster Ridge site (Zier 1982). The large numbers of charred seeds of several taxa recovered from the feature fill at the Taliaferro site, as well as the charred plant macrofossils from the Austin Wash site, provide additional evidence that plant processing of foods were important during this period. The primary function of the Austin Wash and Oyster Ridge sites, however, was the processing of pronghorn.

Flat, circular stone beads are common throughout the Late Prehistoric period being found in Components IV, V, and VI at the Taliaferro site. Bone beads or remnants of the groove-and-snap methods of manufacture occur at several Late Prehistoric sites or components in southwest Wyoming. Stone and bone beads were recovered from the Austin Wash site (Schroedl 1985) and the Wardell Buffalo Trap (Frison 1973).

Plant Macrofossils

A sample of fill from five of the six pit features from Component V was floated and examined for plant macrofossils (Appendix C). A total of 267 charred seeds was recovered, and each feature yielded some macrofossil remains (Table 20). Except for Feature 14 (the rock-filled basin) goosefoot (Chenopodium sp.) is the predominant taxon in each of the features. Beeweed (Cleome sp.) is the most common plant macrofossil in the rock-filled basin. A beeweed seed also occurred in Feature 24. Three features contained charred seeds identified to the mustard (Cruciferae) family. Buttercup (Ranunculus sp.), sunflower (Helianthus sp.), sedge (Carex sp.), Gramineae (grass family), Liliaceae (lily family), and an unknown taxon were present in two features each. Other taxa identified for Component V include saltbush (Atriplex sp.), monolepis (Monolepis nuttalliana), and Indian ricegrass (Oryzopsis hymenoides). The buttercup seeds from this component are the only ones recovered at the site.

As with the other Late Prehistoric components at the site, seeds of weedy species, such as goosefoot and beeweed, dominate the plant macrofossil collection from Component V. These pioneer species thrive in recently disturbed soils but are usually eliminated from the natural vegetation of a locality once ecological succession develops beyond the early stages. At present, goosefoot grows on the disturbed playa surface at the Taliaferro site; however, throughout the Green River Basin these species are generally rare in the vegetation communities. In the past, areas disturbed by humans either intentionally or accidentally could have provided suitable habitat.

The recovery of charred seeds of several taxa from each of the examined features from Component V indicates that the gathering and processing of seeds were important activities at the site during this period. Most likely, seeds of several species were processed together. The mixing of different kinds of seeds was a common practice among the Indians of the area during ethnographic and historic times (Appendix C). The seeds from most taxa represented in this component are available in the late summer and fall, around August and September. This suggests an occupation for the component at least during this time of year. The seeds probably were collected for winter stores. A few of the recovered charred seeds were identified to taxa, such as buttercup and lily, that bloom in the spring and early summer. This indicates that the site may have been occupied as early as June.

Pollen

Three samples of feature fill and washes from the surface of three pieces of groundstone were processed and counted for pollen (Appendix D). The pit features examined were Feature 9 (a bell-shaped pit), Feature 10 (a small basin-shaped pit), and Feature 14 (a rock-filled basin). The groundstone artifacts include a shaped slab metate (SCL14.1101) found within the fill of Feature 14, an unshaped slab metate (SCL14.1301) located less than a meter to the northeast of Feature 14, and a shaped mano (SCL14.1279) recovered near Feature 24.

Table 20. Summary of plant macrofossils recovered from Component V, Taliaferro site.

Feature No.	Volume of Sample (liter)	Percent[a]	Number of Charred Seeds	Plant Taxon (in order of greatest frequencies)
9	10.0	20	52	Goosefoot, saltbush, unknown, buttercup, grass family
10	5.0	59	12	Goosefoot, grass family, mustard family, sunflower, lily family
12	10.0	100	63	Goosefoot, Indian ricegrass, mustard family
14	12.5	74	119	Beeweed, goosefoot, lily family, monolepis, unknown, sunflower, sedge
24	2.5	83	21	Goosefoot, unknown, buttercup, mustard family, beeweed, sedge

[a]Percent examined of total feature volume

The presence of a high frequency of Cheno-am (goosefoot and amaranth families) pollen with aggregates in Feature 9 suggests that goosefoot seeds or greens were processed in the vicinity of the feature. This interpretation is consistent with the plant macrofossil assemblage from the feature. Charred goosefoot seeds are the most common plant macrofossil from Feature 9. For Feature 10, the percentage of Cheno-am pollen is lower than that for Feature 9; however, aggregates were noted for the Feature 10 sample, which provides evidence for goosefoot processing. Goosefoot seeds also were recovered from the feature. Feature 14 produced even a lower percentage of Cheno-am pollen than the other two features, but aggregates are still present. An elevated frequency of greasewood (Sarcobatus sp.) pollen with aggregates also occurs in the sample from Feature 14, indicating this shrub was used for fuel. Feature 14 has an aggregate of grass (Gramineae) pollen, though the feature lacked charred grass seeds. Grass may have been used to line the pit.

The shaped slab metate (SCL14.1101) from the fill of Feature 14 has a higher frequency of Cheno-am pollen than the sample from the feature. This higher frequency suggests that goosefoot seeds probably were ground on the metate. The pollen sample from the unshaped slab metate lacks pollen frequencies or types indicating the use of the metate. The mano (SCL14.1279) contains Cheno-am pollen frequencies as high as those for Feature 9, which is the highest for the site. It was probably used to grind goosefoot seeds.

As with the other Late Prehistoric components, the gathering and processing of seeds was a major activity at the site during Component V times as evidenced by the plant macrofossil and microfossil analyses. Seeds of several taxa, especially goosefoot, were intensively processed in the vicinity of the features.

Animal Remains

A total of 314 specimens of bone, teeth, and shell was recovered from Component V (Appendix E). This constitutes the largest sample of all the components from the Taliaferro site. Table 21 presents the number of specimens and the minimum number of individuals by taxon or analytical group.

Six taxa were identified, including large and small mammals, sage grouse, and freshwater mollusks. Mule deer is represented by a acetabulum fragment and pronghorn by a pisiform and a fetal calcaneus. Two fetal vertebra fragments identified as small to medium Artiodactyl are probably pronghorn. All the specimens grouped as Artiodactyl belong to deer- or pronghorn-sized animals as well. The anatomical elements of the jackrabbit specimens are a mandible, frontal, radius, pubis, femur, tibia, and metatarsal. Cottontail bones include a temporal and a tibia fragment. An ulna and radius fragment of a sage grouse also were recovered. The remaining specimens, 83% of the collection, are unidentifiable fragments.

Less variety in the taxa exists in the collection from this component than in the one from the earlier Late Prehistoric Component IV. Though both large and small mammals are represented in the Component V collection, the majority of the specimens are from identified or unidentified large mammals. The large mammals include mule deer and pronghorn, which is a change from earlier components. This is the first occurrence of mule deer for the site. Specimens of bison, which are present in Components III and IV, are absent in this component. There appears to be a focus in the subsistence base during Component V times on small to medium Artiodactyls, with an emphasis on pronghorn. Jackrabbits, cottontail, and sage grouse also were exploited, though in minor amounts. Bird eggs were collected as well. Evidence for the continued use of riparian environments comes from the presence of mussel shells in the collection. Freshwater mollusks most likely were obtained from the Green River.

The larger game animals probably were obtained at some distance from the site and only selected portions were brought back for further processing. Most recovered anatomical elements of these animals are portions of hind quarters and distal extremities of the limbs. As with the other components at the Taliaferro site, a majority of the recovered bone in Component V is unidentifiable fragments. This suggests the maximum use of these animals. The bone was probably processed for its marrow and grease and juice. Only 74 of the 314 specimens displayed evidence of burning.

Evidence for the season of occupation comes from the presence of fetal pronghorn bone, bird egg shell, and mollusk remains. The peak birthing season for pronghorn is the first week of June. The presence of fetal pronghorn bone would indicate an occupation sometime between early May and the middle of June. Sage grouse eggs generally are available in April or May, which provides additional evidence for a spring occupation. Mussels can be collected from the spring through the fall.

As with Component V at the Taliaferro site, animal remains from other excavated sites of similar age in southwest Wyoming represent primarily small- to medium-sized Artiodactyls. Remains from small animals constitute only a minor portion of the assemblages from most of these sites. Pronghorn was the dominant species identified at the Oyster Ridge site, with an age of 1350 years ago (Zier 1982) and the Austin Wash site, dating between 1070 and 1370 years ago (Schroedl 1985). Both are pronghorn kill or processing sites. The Oyster Ridge site also produced a few specimens from sage grouse and rabbit. In addition to at least 15 pronghorn individuals, other taxa from the Austin Wash site include bison, coyote, jackrabbit, and cottontail. Component IV at the Cow Hollow Creek site, with an age of 1280 years ago, yielded mostly specimens from deer or pronghorn as well (Schock et al. 1982). The few specimens from Component II at the Paradox Ridge site, dating to 1390 years B.P., were identified as pronghorn, sage grouse, jackrabbit, and cottontail

Table 21. Animal remains by taxon, Component V, Taliaferro site.

Taxon	N	MNI
Mule deer (Odocoileus hemionus)	1	1
Pronghorn (Antilocapra americana)	2	2
Jackrabbit (Lepus sp.)	12	2
Cottontail (Sylvilagus sp.)	2	1
Sage grouse (Centrocercus urophasianus)	3	1
Artiodactyl	32	-
Large mammal	102	-
Medium to large mammal	66	-
Medium mammal	19	-
Small to medium mammal	22	-
Small mammal	45	-
Egg shell	6	-
Mussel shell (Margaritifera sp.)	2	-
Total	314	-

Key: N = Number of identified specimens
MNI = Minimum number of individuals

(Gardner et al. 1982). Bird egg shell fragments also were recovered from Paradox Ridge.

Spatial Distribution of Remains

The spatial distribution of features, fire-cracked rock, flaked stone artifacts, groundstone, debitage, and bone was plotted for Component V. The relationships of these remains provide some clues about the type and location of the activities conducted at the site.

The distribution of features and fire-cracked rocks is shown in Figure 54. The features occur in the center and in the western half of the excavation area. They are spaced about 2 m apart. Most of the fire-cracked rocks are to the east of the features. The rocks are scattered fairly evenly throughout the eastern half, though they are slightly more concentrated between Features 9 and 10 and in the northeastern portion of the excavation area.

Figure 55 shows the distribution of the flaked stone artifacts and groundstone. The density values by square meter for all flaked stone artifacts across the excavation area were smoothed using trend surface analysis (Hodder and Orton 1976:155). The trend surface map indicates that flaked stone artifacts are most common in the southern portion of the excavation area between Features 9 and 10. Other dense areas occur in the northeastern portion with only a few artifacts present in the western half. The distribution of the flaked stone artifacts follows the pattern for the fire-cracked rocks.

Individual maps were made showing the number per square meter of projectile points, bifaces, retouched and utilized flakes, cores, and groundstone. Insufficient quantities of these artifact types precluded the use of trend surface analysis. The distribution of the projectile points is similar to the pattern for all flaked stone artifacts. Bifaces, including preforms, blanks, preblanks, and unclassifiable (fragments) bifaces, are scattered

Figure 54. Plan map of Excavation Area B showing distribution of features and fire-cracked rock, Component V, Taliaferro site.

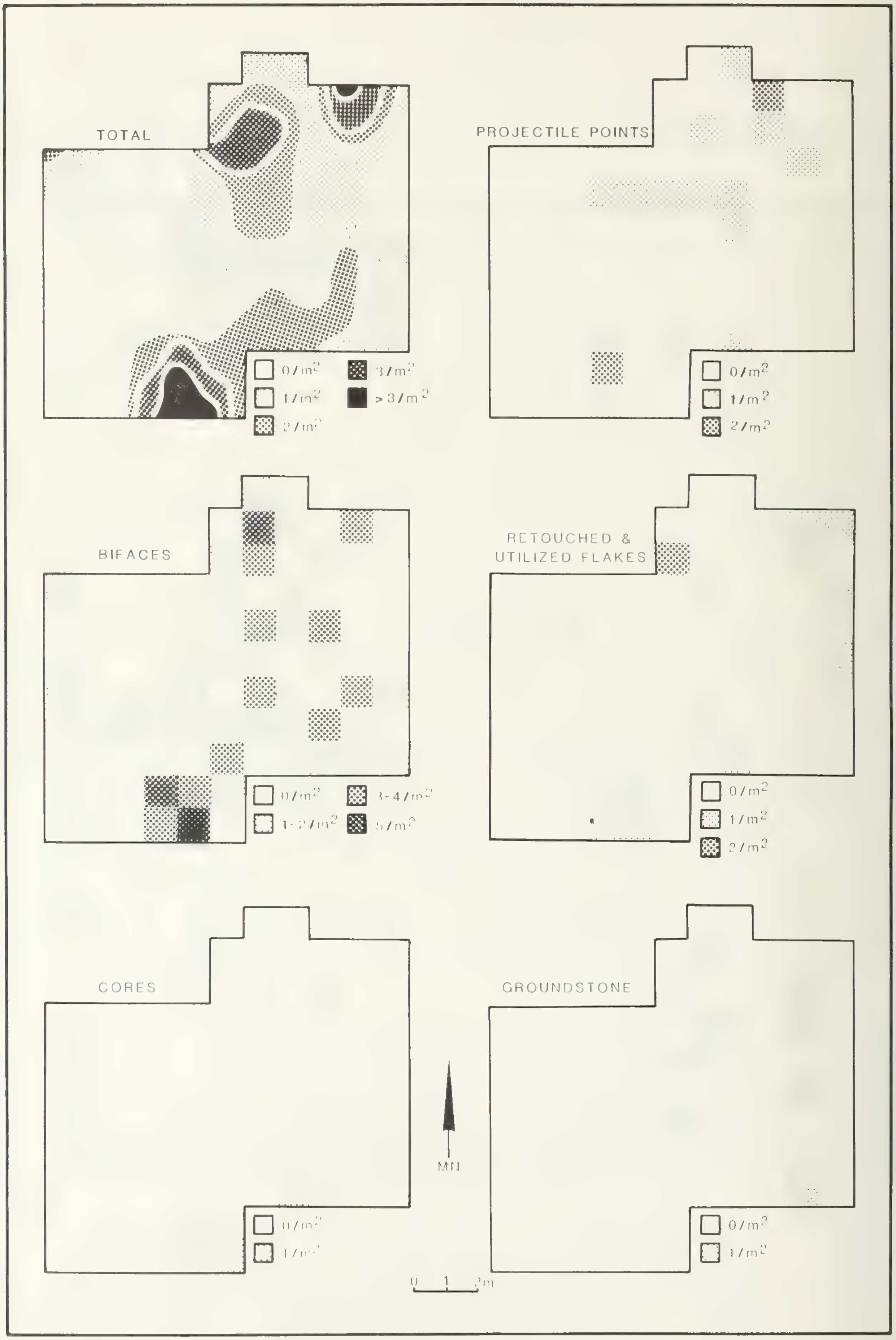


Figure 55. Plan maps of Excavation Area B showing the horizontal distribution of all flaked stone and groundstone tools, Component V, Taliaferro site.

throughout but are most concentrated in the southern portion of the excavation area between Features 9 and 10. Retouched and utilized flakes are found mostly in the northeastern corner. The few cores occur in the northern and southern portions, and pieces of groundstone are present throughout the eastern half of the excavation area. Overall, the various artifact types lack distinct distributions.

Figure 56 provides trend surface maps for total debitage and individual maps for the various material types. The most dense area for total debitage is along the southern edge of the excavation area. This partly corresponds with the high density peak for all flaked stone artifacts which is to the south and east of Features 9 and 10. Debitage is also common in the northern portion of the excavation area.

The individual trend surface maps of the various material types are roughly similar to the one for total debitage. In addition to a high density peak along the southern edge of the excavation block for translucent algalitic chert, other dense areas occur throughout the eastern half. Opaque algalitic chert debitage is limited mostly to the southern edge. Dense areas of Whiskey Buttes chert and obsidian are present in the center of the excavation area.

The distribution of animal remains is shown in Figure 57. Individual trend surface maps were made for the number and weight of bone per square meter. The two trend surface maps are fairly similar with both exhibiting density peaks along the southern edge of the excavation block. The map displaying the distribution for number also contains a dense area in the northeastern corner. This may indicate that the bone specimens are smaller and more fragmentary in the northeastern corner than those along the southern edge. The trend surface maps for bone follow a pattern similar to those for flaked stone artifacts and debitage.

The density maps broken down by number of each taxon per square meter show that Artiodactyl remains, including deer and pronghorn, are concentrated along the southern edge and in the extreme northern corner of the excavation area. The unidentifiable large mammal remains are located mostly in these areas but are also scattered throughout the eastern half of the block. The distribution of the small animal remains is similar to that of the large mammal bone; however, sage grouse bone is present only in the northern portion and mussel shell occurs in the western half near the features.

Generally, the flaked stone artifacts, debitage, and animal remains are concentrated along the southern edge of the excavation area just to the south and east of Features 9 and 10. This dense area probably continues into the unexcavated area to the south. Most of the cultural material from Component V follows the distribution of the fire-cracked rocks, which are scattered throughout the area east of the features. Little material was found in the area to the west.

Component VI

The only Late Prehistoric component represented in Excavation Area A is Component VI. It occurs throughout the south half of the excavation block and, ephemerally, along the western and southern edges of the north half. For this component, 128 m² were excavated in 1985. An additional 6 m² were removed during test excavations in 1984. In the south half of the excavation area, large quantities of archaeological material, which has been grouped into Component VI, is present in deposits over 60 cm thick. These remains represent several occupations occurring throughout the Late Prehistoric period, but finer divisions were undiscernible across the entire area. Some

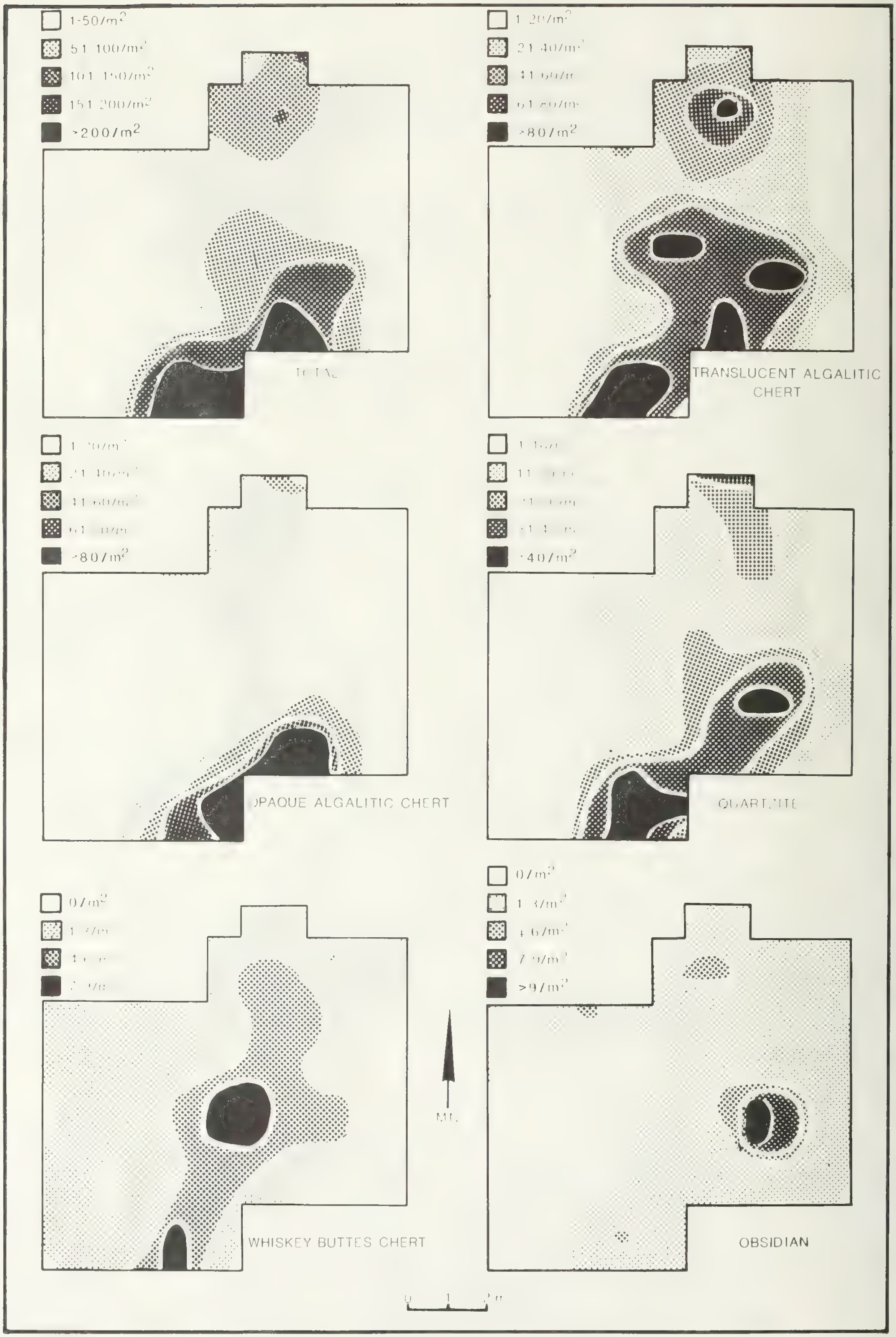


Figure 56. Plan maps of Excavation Area B showing the horizontal distribution of tool debitage and material types, Component V, Taliaferro site.

Figure 57. Plan maps of Excavation Area B showing the horizontal distribution of animal remains, Component V, Taliaferro site.

of these occupations probably have ages similar to the Late Prehistoric Components IV, V, and VII delineated in Excavation Area B.

For the spatial analyses, the 60 cm thick deposits were separated into three parts. The deposits belonging to the middle layer of this division are associated with Feature 30, the large stratified basin with an age of 1170 years ago, and are designated as VIb; the layer above (VIc) most likely dates to the period corresponding to Component VII and the one below (VIa) to Components IV and V.

Features

Four pit features were present in Component VI (Table 22). These included a stratified basin, Feature 30; two small basins, Features 29 and 33; and a large basin, Feature 34 (Appendix A). Except for the large basin, Feature 34, all are associated with occupation layer VIb that dates to 1170 years ago. The large basin occurred in the lower layer (VIa).

The large stratified basin, Feature 30, was unique for the site and was by far the largest, measuring 215 x 195 x 29 cm (Figure 58). It was roughly circular in plan view, and the fill was stratified. The upper portion was uncompacted, quite dark, and contained large amounts of charcoal and debris (Figure 59). Though it had charcoal flecks, the lower layer was a lighter brown. This was also uncompacted. Most of the artifacts, debitage, charred seeds, and bone came from the upper darker layer. Among the 62 pieces of recovered bone were a mandible of a sucker (Catostomus sp.), a burned ischium of a ground squirrel (Spermophilus richardson), bone fragments of rabbit and unidentifiable mammal, and egg shell. Ten taxa of charred seeds, including over 3000 goosefoot (Chenopodium sp.) seeds, were recovered during the plant macrofossil analysis. The floor and sides of the basin were distinct except for the eastern downslope side. Figure 60 shows the feature after excavation.

This large feature was located on the slope on the leeward edge of a sand shadow. The area on the downslope side, to the east and north of the basin, contained a scattering of fire-cracked rock mixed with flaked stone tools and debitage. In contrast, the west and south sides, or the direction of the prevailing wind, had relatively few pieces of fire-cracked rock.

Most likely this basin originally was covered by a temporary structure, or wickiup, and represents a concentrated living area. A windbreak of some sort could have been constructed around its west side, the side of the prevailing winds, and opposite the scatter of fire-cracked rock. Many of the daily tasks would have occurred within the basin and around the leeward side where most debris was found. As evidenced by the recovery of thousands of charred seeds and pieces of debitage, as well as flaked stone artifacts and bone fragments, several kinds of activities were performed in the sheltered feature area.

The size and shape of the basin are consistent with habitations recorded in the historic and ethnographic literature for the Intermountain West. The structure or windbreak surrounding Feature 30 may have been similar to the one recorded by J. H. Simpson during his exploration of the Great Basin in 1859. He mentions in his journal that

> . . . Lieutenant Murry and myself took a stroll up the creek to view a wick-e-up of the Diggers that have visited our camp. . . . Returning on the other side of the creek, we at last got sight of it, it being only distinguished from the sage-brushes around it by the circular form given to its development, it being made of these

Table 22. Characteristics of pit features, Component VI, Taliaferro site.

Feature No.	Type	Volume (liter)	Area (cm²)	Artifacts	Debitage (total)	Bone No.	Bone wt.(g)	Plant Macro-fossils[a]	Charcoal[b]
29	Small basin	1.0	363.0	-	-	-	-	2	much
30	Stratified basin	571.0	31,416.0	Projectile point, preform fragment, preblank, 2 indeterminate bifaces, core, retouched flake, incised sandstone fragment, bone bead	3245	62	4.3	10	much
33	Small basin	1.0	240.0	-	-	-	-	0	little
34	Large basin	32.5	6291.0	-	12	-	-	3	much

[a]Number of taxa

[b]Relative amount

bushes in their growing state, and some loose thrown in [Simpson 1876:72].

Captain Bonneville also observed sagebrush windbreaks while traveling through southern Idaho in January 1834. He notes that the Diggers "live without any further protection from the inclemency of the season, than a sort of break-weather, about three feet high, composed of sage, (or wormwood) and erected around them in a shape of half moon" (Irving 1854:259). The construction of a sagebrush windbreak or wickiup would have required little labor but would have provided a wind-free, shaded work and sleeping area (Also see Euler [1966; Appendix I, Figures 11, 13, 14, 15, 20, 30, 31, 33, and 51] for photographic examples of southern Piaute wickiups and wind breaks). Evidence for a sagebrush windbreak around Feature 30 at the Taliaferro site comes from the frequencies of sagebrush pollen in samples taken from the occupation floor next to the feature. The sagebrush pollen frequencies are higher in the samples from the western and southern sides than from the northern and eastern ones, indicating that sagebrush was piled on the side of the prevailing wind.

In another place in his journal, Simpson mentions that shelters were placed "in such a manner as to break off, to the height of about 4 feet, wind from the prevailing direction. In this enclosure were a number of men, women, and children. . . .An old women superintended the cooking, and at the same time was engaged in dressing an antelope-skin" (1876:51-52). The above quote indicates that a group of people used the protected area, and several tasks were conducted simultaneously. This is consistent with the evidence from Feature 30.

Figure 58. Feature 30 (arrow), the stratified basin, before excavation, showing associated artifacts and fire-cracked rock, Component VI, Taliaferro site.

Figure 59. Feature 30, the stratified basin, showing cross section of the stratified fill, Component VI, Taliaferro site.

Figure 60. Feature 30, after excavation, Component VI, Taliaferro site.

The remains of Feature 30 also may represent an area of intensive activities that lacked an actual structure. During his explorations of the Colorado River in the late 1860s and 1870s, Powell observed the Kaibab Paiute of northern Arizona and southern Utah and noted that "In this climate most of the year is dry and warm, and during such time they do not care for shelter. Clearing a small, circular space of ground, they bank it around with brush and sand, and wallow in it during the day, and huddle together in a heap at night, men, women, and children; buckskins, rags, and sand" (1875:126). However, in southwest Wyoming where the wind blows almost constantly and the climate is relatively cool, a sheltered area would have been necessary for many tasks. The actual basin at the Taliaferro site may have formed unintentionally from activities such as those mentioned in the above quote.

Three large basins (housepits) similar to Feature 30 were excavated at the Buffalo Hump site in the Red Desert (Harrell 1987). They also were located on the leeward slope of a sand shadow and averaged about 200 cm in diameter and 40 cm in depth. One was radiocarbon estimated at 1270 years B.P. and another at 1480 years B.P. In contrast to Feature 30 at the Taliaferro site, two of these basins contained interior pits and the third had exterior ones. The large basins at the Buffalo Hump site probably were covered with some type of superstructure. Like Taliaferro, pollen data suggests that sagebrush was employed in the construction of the superstructures at Buffalo Hump (Harrell 1987:p5.12).

At the Taliaferro site, two small basins, Features 29 and 33, also belonged to the same occupation layer within Component VI as Feature 30. Situated just to the north of Feature 30, Feature 29 was a small basin filled mostly with large chunks of sagebrush charcoal. Charred seeds included two goosefoot (Chenopodium sp.) and one beeweed (Cleome sp.). The other small basin, Feature 33, was located about 3 m northwest of Feature 30 and was associated with Fire-cracked Rock Concentration D. The feature contained a gray sediment with little charcoal and lacked bone and charred plant macrofossils. The surrounding concentration of fire-cracked rock measured about 150 x 140 cm and consisted of 55 rocks. As with most of the small basins at the Taliaferro site, these probably served as dumps for refuse.

The remaining pit feature for Component VI was a large basin, Feature 34, that belonged to the lower occupation layer VIa below Feature 30. It probably dates to the early portion of the Late Prehistoric period and corresponds to the age of Components IV and V (ca. 1500-1300 B.P.). The feature was partly deflated along the eastern downslope side and had a dark sediment with large amounts of charcoal and three taxa of charred seeds. The majority of the charred seeds were goosefoot (Chenopodium sp.). This large basin was similar to the two from Component IV, without associated features. It also may have served as a dump for charcoal during seed processing activities.

In addition to the pit features, a large dark midden area was present within the northern and eastern portions of the south half of Excavation Area A (Appendix A). The midden contained material from each of the three occupation layers belonging to Component VI. It measured approximately 8 x 6 m, and the center was over 50 cm thick; but it sloped steeply up toward the edges. The midden appears to have formed in the natural swale which crossed the center of the excavation area.

Flaked Stone Artifacts

A total of 228 flaked stone tools and 9485 pieces of debitage was recovered from Component VI deposits. They include 33 projectile points, 5 notched bifaces, 5 drills, 14 final biface tips, 79 preforms, 22 blanks, 27

Table 23. Crosstabulation of flaked stone artifact type by material type, Component VI, Taliaferro site.

Artifact Type		Material Type						
		Trans-lucent Chert	Opaque Chert	Quartzite	Moss Agate	Whiskey Buttes Chert	Obsidian	Total
Large, Side-Notched Point, Type III	#	1	0	0	0	0	0	1
	Row %	100.0	0	0	0	0	0	0.4
	Column %	0.8	0	0	0	0	0	
	Total %	0.4	0	0	0	0	0	
Large, Lanceolate Point, Type I	#	1	0	0	0	0	0	1
	Row %	100.0	0	0	0	0	0	0.4
	Column %	0.8	0	0	0	0	0	
	Total %	0.4	0	0	0	0	0	
Misc. Large Point Fragment	#	0	1	0	0	0	1	2
	Row %	0	50.0	0	0	0	50.0	0.9
	Column %	0	1.6	0	0	0	14.3	
	Total %	0	0.4	0	0	0	0.4	
Small, Corner-Notched Point	#	13	10	1	0	1	3	28
	Row %	46.4	35.7	3.6	0	3.6	10.7	12.3
	Column %	10.7	15.6	3.8	0	14.3	42.8	
	Total %	5.7	4.4	0.4	0	0.4	1.3	
Small Side-Notched Point	#	0	0	1	0	0	0	1
	Row %	0	0	100.0	0	0	0	0.4
	Column %	0	0	3.8	0	0	0	
	Total %	0	0	0.4	0	0	0	
Notched Knife	#	0	5	0	0	0	0	5
	Row %	0	100.0	0	0	0	0	2.2
	Column %	0	7.8	0	0	0	0	
	Total %	0	2.2	0	0	0	0	
Drill	#	2	2	0	0	1	0	5
	Row %	40.0	40.0	0	0	20.0	0	2.2
	Column %	1.6	3.1	0	0	14.3	0	
	Total %	0.9	0.9	0	0	0.4	0	
Final Biface Tip	#	10	4	0	0	0	0	14
	Row %	71.4	28.6	0	0	0	0	6.1
	Column %	8.2	6.3	0	0	0	0	
	Total %	4.4	1.8	0	0	0	0	
Large Preform	#	0	1	4	0	0	0	5
	Row %	0	20.0	80.0	0	0	0	2.2
	Column %	0	1.6	15.4	0	0	0	
	Total %	0	0.4	1.8	0	0	0	
Small Preform, Type I	#	4	0	0	0	0	0	4
	Row %	100.0	0	0	0	0	0	1.8
	Column %	3.3	0	0	0	0	0	
	Total %	1.8	0	0	0	0	0	
Small Preform, Type IIa	#	4	1	0	0	0	0	5
	Row %	80.0	20.0	0	0	0	0	2.2
	Column %	3.3	1.6	0	0	0	0	
	Total %	1.8	0.4	0	0	0	0	

Table 23. Continued.

Artifact Type		Material Type						
		Trans-lucent Chert	Opaque Chert	Quartzite	Moss Agate	Whiskey Buttes Chert	Obsidian	Total
Small Preform, Type IIb	#	3	1	0	0	0	1	5
	Row %	60.0	20.0	0	0	0	20.0	2.2
	Column %	2.5	1.6	0	0	0	14.3	
	Total %	1.3	0.4	0	0	0	0.4	
Small Preform, Type III	#	3	0	0	0	0	0	3
	Row %	100.0	0	0	0	0	0	1.3
	Column %	2.5	0	0	0	0	0	
	Total %	1.3	0	0	0	0	0	
Preform Fragment	#	42	11	2	1	0	1	57
	Row %	73.7	19.3	3.5	1.8	0	1.8	25.0
	Column %	34.4	17.2	7.7	50.0	0	14.3	
	Total %	18.4	4.8	0.9	0.4	0	0.4	
Blank	#	11	6	3	0	2	0	22
	Row %	50.0	27.3	13.6	0	9.1	0	9.6
	Column %	9.0	9.4	11.5	0	28.6	0	
	Total %	4.8	2.6	1.3	0	0.9	0	
Preblank	#	10	12	3	1	1	0	27
	Row %	37.0	44.4	11.1	3.7	3.7	0	11.8
	Column %	8.2	18.8	11.5	50.0	14.3	0	
	Total %	4.4	5.3	1.3	0.4	0.4	0	
Indeterminate Biface	#	9	4	0	0	0	0	13
	Row %	69.2	30.8	0	0	0	0	5.7
	Column %	7.4	6.3	0	0	0	0	
	Total %	3.9	1.8	0	0	0	0	
Distal Retouched Flake, Type II	#	0	1	0	0	0	0	1
	Row %	0	100.0	0	0	0	0	0.4
	Column %	0	1.6	0	0	0	0	
	Total %	0	0.4	0	0	0	0	
Lateral Retouched Flake, Type I	#	1	0	0	0	0	0	1
	Row %	100.0	0	0	0	0	0	0.4
	Column %	0.8	0	0	0	0	0	
	Total %	0.4	0	0	0	0	0	
Lateral Retouched Flake, Type II	#	1	1	0	0	1	0	3
	Row %	33.3	33.3	0	0	33.3	0	1.3
	Column %	0.8	1.6	0	0	14.3	0	
	Total %	0.4	0.4	0	0	0.4	0	
Notched Flake	#	0	0	0	0	1	0	1
	Row %	0	0	0	0	100.0	0	0.4
	Column %	0	0	0	0	14.3	0	
	Total %	0	0	0	0	0.4	0	
Graver	#	1	1	0	0	0	0	2
	Row %	50.0	50.0	0	0	0	0	0.9
	Column %	0.8	1.6	0	0	0	0	
	Total %	0.4	0.4	0	0	0	0	

Table 23. Concluded.

Artifact Type		Material Type: Trans-lucent Chert	Opaque Chert	Quartzite	Moss Agate	Whiskey Buttes Chert	Obsidian	Total
Irregular Retouched Flake	#	0	0	1	0	0	0	1
	Row %	0	0	100.0	0	0	0	0.4
	Column %	0	0	3.8	0	0	0	
	Total %	0	0	0.4	0	0	0	
Utilized Flake	#	2	3	5	0	0	0	10
	Row %	20.0	30.0	50.0	0	0	0	4.4
	Column %	1.6	4.7	19.2	0	0	0	
	Total %	0.9	1.3	2.2	0	0	0	
Modified Cobble	#	0	0	3	0	0	0	3
	Row %	0	0	100.0	0	0	0	1.3
	Column %	0	0	11.5	0	0	0	
	Total %	0	0	1.3	0	0	0	
Residual Core	#	0	0	1	0	0	1	2
	Row %	0	0	50.0	0	0	50.0	0.9
	Column %	0	0	3.8	0	0	14.3	
	Total %	0	0	0.4	0	0	0.4	
Multidirectional Core	#	4	0	2	0	0	0	6
	Row %	66.7	0	33.3	0	0	0	2.6
	Column %	3.3	0	7.7	0	0	0	
	Total %	1.8	0	0.9	0	0	0	
Total	#	122	64	26	2	7	7	228
	%	53.5	28.1	11.4	0.9	3.1	3.1	100.0

preblanks, 13 indeterminate bifaces, 9 retouched flakes, 10 utilized flakes, 3 modified cobbles, and 8 cores (Table 23). Figures 61 and 62 illustrate examples of the flaked stone artifact types from Component VI.

The projectile points assigned to Component VI were classified as Type III large, side-notched; Type I lanceolate; miscellaneous large point fragments; small, corner-notched; and small, side-notched. The Type III large, side-notched point resembles the Avonlea type of the Northwestern Plains (Kehoe and McCorquodale 1961). On the Northwestern Plains, Avonlea points usually date between 1800 and 1400 years ago but often are associated with the earlier Pelican Lake Corner-notched type (Reeves 1983). In addition to the one from Component VI, Type III large, side-notched points occur in the Late Archaic Component III. The specimen from Component VI has been reworked. The Type I lanceolate point from Component VI is probably out of place and most likely originated from the Middle Archaic Component II. Two large point fragments also are part of the assemblage from Component VI.

Twenty-eight small, corner-notched points were recovered; 13 are of translucent algalitic chert, 10 are of opaque algalitic chert, 1 is of quartzite, 1 is of Whiskey Buttes chert, and 3 are of obsidian. The points are common in all the Late Prehistoric components at the Taliaferro site except Component VIII. Besides those from Component VI, another 44 are present in the Late Prehistoric Components IV, V, and VII. The small,

Figure 61. Example of flaked stone artifact assemblage from Component VI, Taliaferro site. a, Large, side-notched projectile point, Type III; b, Large, lanceolate projectile point, Type I; c-f, Small, corner-notched projectile point; g, Small, side-notched projectile point; h-i, Drill; j-k, Notched knife; l-m, Small preform, Type I; n-o, Small preform, Type IIa; p-q, Small preform, Type IIb; r, Small preform, Type III.

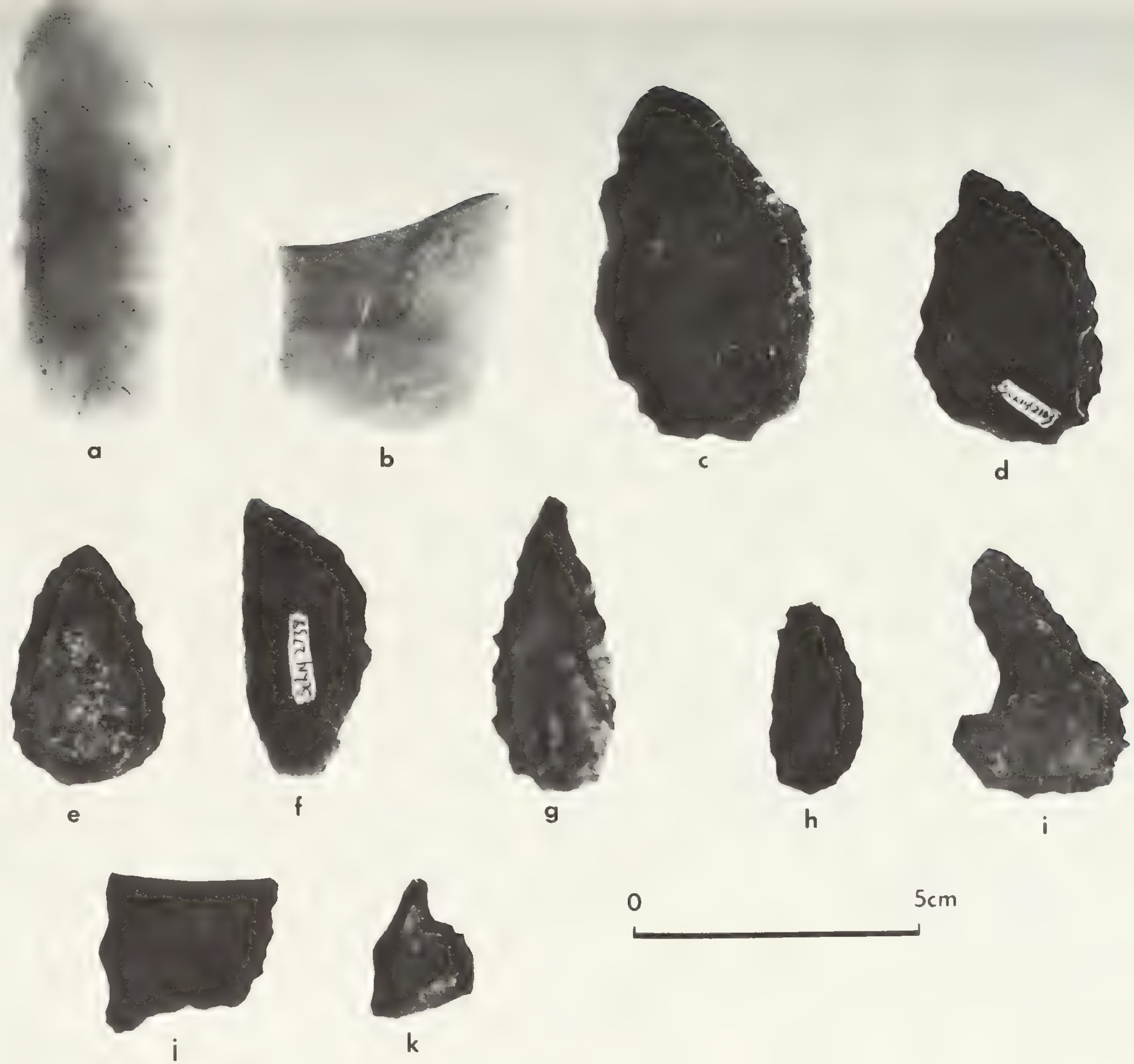


Figure 62. Example of flaked stone artifact assemblage from Component VI, Taliaferro site. a-b, Large preform; c, Blank; d, Preblank; e, Distal retouched flake, Type II; f, Lateral retouched flake, Type I; g-h, Lateral retouched flake, Type II; i-j, Graver; k, Notched flake.

corner-notched points from the Taliaferro site date between 1500 and 960 years ago, which is consistent with their age in nearby regions. Other sites in southwest Wyoming of similar age as Component VI that contain Rose Spring points include Austin Wash with radiocarbon ages ranging from 1370 to 1070 years ago and Component III (1130 years B.P.) at 48UT779 (Schroedl 1985).

One small, side-notched projectile point is associated with Component VI. Others are from the Late Prehistoric Components V, VII, and VIII. This point most closely resembles the Uinta Side-notched type that is common in Fremont sites dating between 1150 and 750 years ago (Holmer and Weder 1980). In southwest Wyoming, small, side-notched points are the most common point type at the Wardell Buffalo Trap (Frison 1973). Another was identified from Component IV (1140 years B.P.) at the Maxon Ranch site (Harrell and McKern 1986). The specimen from Component VI corresponds in age to the temporal span of the small side-notched points in the region.

The five notched bifaces (knives) from Component VI were the only ones recovered at the Taliaferro site. All have corner notches, are of opaque algalitic chert, and except for one, are broken. Similar hafted knives are part of the artifact collection from the Late Prehistoric period Austin Wash site (Schroedl 1985). Component VI produced 45.5% of the drills for the site. Two of the drills have rounded bases and lack tips. Another is a complete bit without a pronounced base, and the remaining two are distal fragments. A rounded base drill also was found in Component V deposits. In southwest Wyoming, a similar rounded base is associated with Component II at the Sheehan site with radiocarbon ages of 1440 and 1190 years ago (Bower et al. 1986). The 14 final biface tips are probably distal portions of projectile points.

Of the five large preforms, four are of quartzite and one is of opaque algalitic chert. Small preform Types I, IIa, IIb, and III are associated with Component VI. Type I preforms occur at the Taliaferro site in the latter part of the Archaic period and the early portion of the Late Prehistoric. Type IIa and IIb small preforms are part of the flaked stone artifact assemblage of the Late Archaic Component III and the Late Prehistoric Components IV-VII. The Type III small preforms have wider bases than Types IIa and IIb and are generally thicker than the other small preforms. They belong solely to the Late Prehistoric Components V and VI. By far, most (57) of the recovered preforms are fragments. Preform fragments are the dominant artifact type for the Late Prehistoric Components IV-VII. Small preforms similar to those from Component VI are common at Late Prehistoric sites throughout the region, including the Austin Wash site (Schroedl 1985) and the Sheehan site (Bower et al. 1986).

Half of the 22 blanks are of translucent algalitic chert, and opaque algalitic chert is the second most common material type. For the preblanks, translucent and opaque algalitic chert are about equally represented. This distribution of material type for the blanks and preblanks corresponds to that of the preforms and projectile points from the component. The material types for the 13 indeterminate bifaces are also translucent and opaque algalitic chert.

The nine retouched flakes are Type II distal retouched, Types I and II lateral retouched, a notched flake, gravers, and an irregular retouched flake. In addition to unifacial retouch along the distal margin, the Type II distal retouched flake specimen from Component VI has lateral retouch from shaping. Type II flakes also are part of the flaked stone artifact assemblage from the Early Archaic Component I and the Late Prehistoric Components IV and VII. Type I flakes have a straight margin along the working edge, and Type II flakes have a curved margin and are generally smaller. The Type I lateral retouched flakes occur in most components at the site, and Type II flakes are associated only with Components I, IV, and VI. Distal and lateral retouched flakes are also present at other Late Prehistoric sites in the area, including the Austin Wash site dating between 1370 and 1070 years ago (Schroedl 1985). Two of the four gravers and one of the three notched flakes for the site belong to Component VI.

The ten utilized flakes are of quartzite and opaque and translucent algalitic chert. Three modified quartzite cobbles were recovered. Of the eight cores, two are residual and the others are multidirectional.

As with most components at the Taliaferro site, bifacial reduction was the favored technique for flaked stone tool production during Component VI times. The recovery of preblanks, blanks, preforms, and end products indicates that all stages in the bifacial reduction sequence were performed at the site. The retouching of flakes for implements appears to have been more important for Component VI than for the other Late Prehistoric components. The expedient modification of cobbles or pebbles was only a minor activity. As noted above, most of the preforms are incomplete and probably were broken and rejected during manufacture. Figure 63 illustrates the horizontal distribution of the broken artifacts that were refitted. Component VI has the most refitted artifacts of all components at the site.

A majority (53.5%) of the flaked stone artifacts are of translucent algalitic chert, and the next most common material type is opaque algalitic chert. The heavy reliance on algalitic cherts for toolstone occurs throughout the Late Prehistoric period at the Taliaferro site. In contrast, quartzite was the favored material type for the Early Archaic Component I, and the artifacts are more evenly distributed among the algalitic cherts and quartzite for the Middle and Late Archaic Components II and III.

The crosstabulation of debitage type by material type is presented in Table 24. Translucent algalitic chert is only slightly the dominant material type at 34.9% of the total. Almost equal amounts of opaque algalitic chert (30.1%) and quartzite (30.8%) are present in the debitage collection. This distribution is different from the material type percentages for debitage belonging to the other Late Prehistoric components at the site. For the other components, translucent algalitic chert is by far the most common type represented by the debitage. The high percentages of quartzite for the Component VI debitage contrast with the frequencies for the flaked stone artifacts where translucent algalitic chert dominates. Possibly, many of the finished quartzite implements were removed from the area of production and used elsewhere.

The majority of the debitage consists of tertiary flakes representing 55.8% of the total. Secondary flakes are represented by 22.5% and primary flakes by 11.6%. As shown in Appendix B, these percentages correspond to the expected ratio of flake types if all stages in the bifacial reduction sequence were performed at the site. This ratio is similar for all components, which indicates that the cobbles occurring in the vicinity of the site were completely reduced at the locality. The recovery of bifaces belonging to all stages of production provides additional evidence. As noted for other components, the percentages of flake types broken down by material type show that quartzite has a higher percentage of tertiary flakes than translucent algalitic chert, which has more secondary flakes. This may be due to differences in the size of the original cobbles.

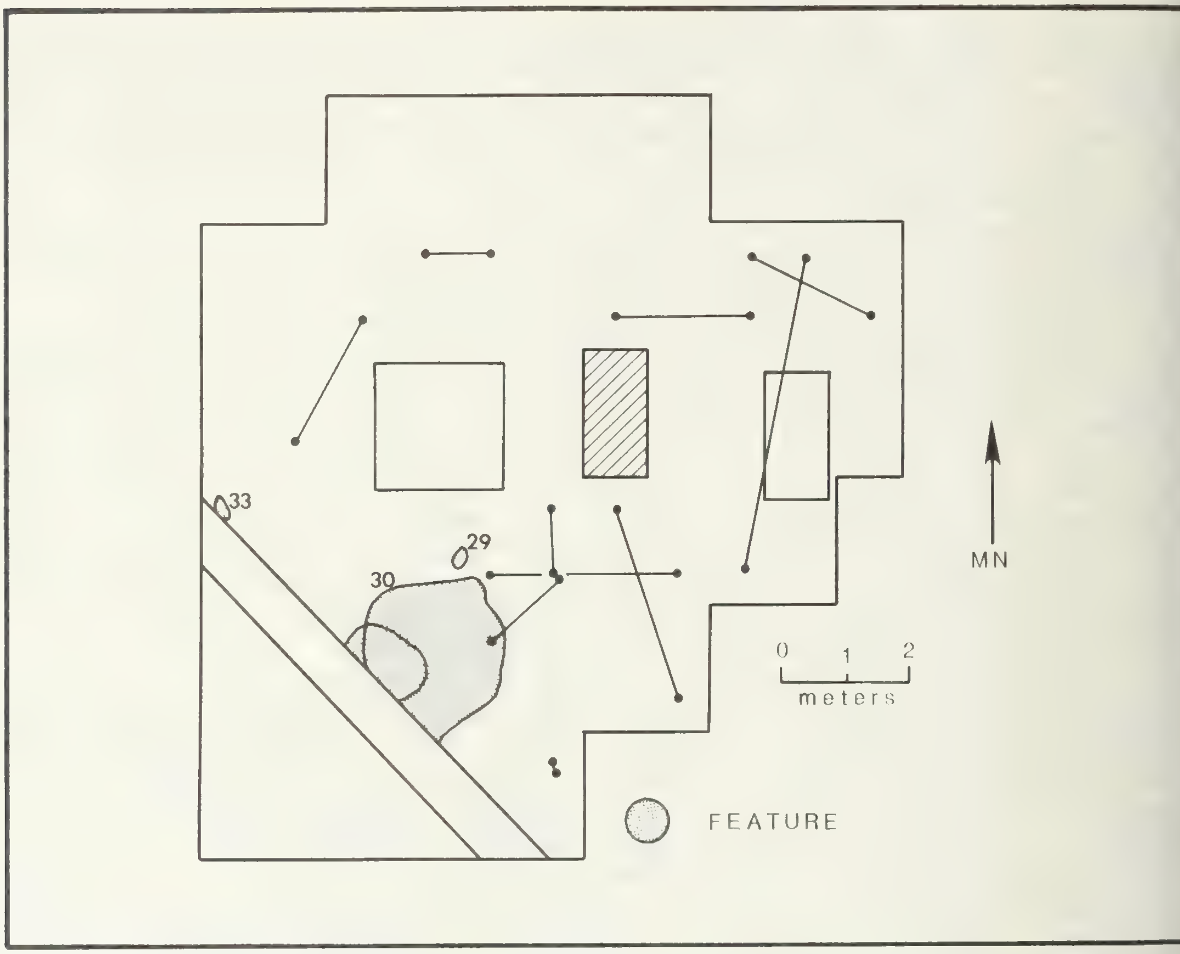


Figure 63. Plan map of the south half of Excavation Area A showing the horizontal distribution of the broken artifacts that were refitted, Component VI, Taliaferro site.

Other Artifacts

Sixteen pieces of groundstone, two stone beads, an incised sandstone fragment, and a bone bead fragment were recovered from Component VI deposits. The component lacked hammerstones. The groundstone implements include four shaped manos, a basin metate, four shaped slab metates, three unshaped slab metates, and four indeterminate groundstone fragments. The shaped manos are bifacially ground or pecked, the shaped metates are unifacially ground and pecked, and the unshaped metates are also unifacially ground or pecked. A complete basin metate with pecked and flaked margins was found in the wall of the backhoe trench dug in 1984. The stone beads are 8.2 and 6.4 mm in diameter and are made of antigorite. A small fragmentary piece of sandstone contains seven parallel lines incised across one surface. It is probably a portion of a pendant and was recovered from Feature 30, the large stratified basin. The bone bead is a disk fragment that also was found in Feature 30.

Along with the Late Prehistoric Component VII, Component VI has the most variety in the kinds of grinding stones for the site; however, each of the Late Prehistoric components has fairly similar tool assemblages. Generally, groundstone artifacts occur at most excavated sites belonging to the Late Prehistoric period in southwest Wyoming. Sites containing groundstone that

Table 24. Crosstabulation of debitage type by material type, Component VI, Taliaferro site.

Flake Type		Material Type: Trans-lucent Chert	Opaque Chert	Quartzite	Whiskey Buttes Chert	Obsidian	Other	Total
Primary	#	406	321	328	20	23	2	1100
	Row %	36.91	29.18	29.82	1.82	2.09	0.18	11.60
	Column %	12.25	11.26	11.24	10.31	12.11	11.11	
	Total %	4.28	3.38	3.46	0.21	0.24	0.02	
Secondary	#	906	700	454	47	22	9	2138
	Row %	42.38	32.74	21.23	2.20	1.03	0.42	22.54
	Column %	27.34	24.54	15.56	24.23	11.58	50.00	
	Total %	9.55	7.38	4.79	0.50	0.23	0.09	
Tertiary	#	1646	1585	1831	106	124	3	5295
	Row %	31.09	29.93	34.58	2.00	2.34	0.06	55.82
	Column %	49.67	55.58	62.77	54.64	65.26	16.67	
	Total %	17.35	16.71	19.30	1.12	1.31	0.03	
Bifacial Thinning	#	220	74	14	9	13	1	331
	Row %	66.47	22.36	4.23	2.72	3.93	0.30	3.49
	Column %	6.64	2.59	0.48	4.64	6.84	5.56	
	Total %	2.32	0.78	0.15	0.09	0.14	0.01	
Shatter	#	121	141	279	11	7	1	560
	Row %	21.61	25.18	49.82	1.96	1.25	0.18	5.90
	Column %	3.65	4.94	9.56	5.67	3.68	5.56	
	Total %	1.28	1.49	2.94	0.12	0.07	0.01	
Tested Material	#	15	31	11	1	1	2	61
	Row %	24.59	50.82	18.03	1.64	1.64	3.28	0.64
	Column %	0.45	1.09	0.38	0.52	0.53	11.11	
	Total %	0.16	0.33	0.12	0.01	0.01	0.02	
Total	#	3314	2852	2917	194	190	18	9485
	%	34.94	30.07	30.75	2.05	2.00	0.19	100.00

have similar dates as Component VI (1170 years ago) include Component II at the Sheehan site (Bower et al. 1986), Component IV at the Maxon Ranch site (Harrell and McKern 1986), and Component III at 48SW1091 (O'Brien 1982). In addition to groundstone artifacts, several Late Prehistoric sites, including the Taliaferro site, have produced charred plant macrofossils from feature fill. This evidence indicates that the collecting and processing of plant foods were important activities.

In addition to Component VI, flat, circular stone beads occur in Late Prehistoric Components IV and V at the Taliaferro site. Bone beads displaying evidence of the groove-and-snap method of manufacture were found in this component and Component V. Stone and bone beads were recovered from the Austin Wash site (Schroedl 1985) and the Wardell Buffalo Trap (Frison 1973). These nonutilitarian artifacts appear to be most common in Late Prehistoric assemblages in southwest Wyoming.

Plant Macrofossils

Fill from the four pit features from Component VI was floated and examined for plant macrofossils (Appendix C). A total of 2396 charred seeds was recovered from three of the features; Feature 33 lacked charred seeds (Table 25). By far, most of the seeds were found in Feature 30, the possible structure. Goosefoot (Chenopodium sp.) is the predominant taxon from the stratified basin and occurred in the other two features as well. Seeds of saltbush (Atriplex sp.), greasewood (Sarcobatus vermiculatus), mustard (Cruciferae), beeweed (Cleome sp.), globemallow (Sphaeralcea sp.), poverty sumpweed (Iva axillaris), sedge (Carex sp.), an unidentified grass (Gramineae), and an unknown taxon also were present in small quantities in Feature 30. This is the only occurrence of globemallow for the site.

Feature 30 appears to have been an area of intensive seed processing as evidenced by the thousands of recovered charred seeds. The processing focused primarily on seeds of goosefoot, but other taxa were also used. Most are pioneer, weedy species that invade recently disturbed areas and could have grown on the site at the time of occupation. Humans could have intentionally disturbed other areas to encourage these species. Goosefoot (C. berlandieri) now grows on the playa adjacent to the Taliaferro site. The seeds of these weedy species are available in the late summer and fall, August and September, suggesting an occupation for the component during this time of year.

Pollen

Thirteen samples from features, occupation floors, and groundstone were processed and counted for pollen (Appendix D). The pit features examined were Feature 30 and a large basin (Feature 34). Two samples were taken from the fill of Feature 30; one was from the lower light layer, and one was from the upper dark layer. An additional eight samples were taken from the occupation floor surrounding (outside) Feature 30. Washes from an unshaped slab metate (SCL14.2385) and a shaped slab metate (SCL14.2429) were examined for pollen. Both were recovered from the area north of Feature 30.

Samples from the fill of Feature 30 have high frequencies of Cheno-am (goosefoot and amaranth families) pollen. The sample from the lower layer contains a slightly higher percentage. A higher frequency of sagebrush (Artemisia sp.) pollen with aggregates is present in the upper fill than in the lower sample. Mustard (Cruciferae) family pollen also was observed in the sample from the lower layer. Additionally, thousands of charred seeds, of which most are goosefoot, were found in the fill of the feature. From the above evidence, the processing of seeds from several taxa, including goosefoot and the mustard family, was a major activity within the confines of Feature 30. The fairly high percentage of sagebrush pollen in the upper fill suggests that a shelter or windbreak was constructed of this material over or around the large basin. As suggested by the pollen frequencies, the fill in the feature probably accumulated during occupation rather than following abandoment.

A series of eight samples taken from the area around Feature 30 exhibits slightly fluctuating frequencies of Cheno-am and sagebrush pollen. The location of each sample in relation to Feature 30 is shown in Appendix D. The samples with the highest percentages of sagebrush pollen were located on the southern, western, and southeastern sides of the feature. The highest frequencies of Cheno-am pollen occur in samples from the northern and eastern sides of the basin. Most likely, a sagebrush shelter or windbreak was placed around the western, southern, and southeastern sides of the basin, the sides

Table 25. Summary of plant macrofossils recovered from Component VI, Taliaferro site.

Feature No.	Volume of Sample (liter)	Percent[a]	Number of Charred Seeds	Plant Taxon (in order of greatest frequencies)
29	2.5	100	3	Goosefoot, beeweed
30	22.5	4	2237	Goosefoot, beeweed, mustard family, sedge, greasewood, unknown, saltbush, globemallow, sumpweed, grass family
33	1.5	100	0	None
34	5.5	17	156	Goosefoot, unknown, saltbush

[a]Percent examined of total feature volume

of the prevailing wind. The processing of goosefoot and other seeds probably took place within the feature and in the area around its northern and eastern sides, the areas protected from the wind.

The two washes from the groundstone produced similar pollen types and frequencies. The fairly high (though not as high as some of the samples associated with Feature 30) frequencies of Cheno-am pollen suggest that goosefoot seeds were ground on the metates. The shaped slab metate (SCL14.2429) produced Liliaceae (lily family) pollen, and the unshaped slab metate (SCL14.2385) yielded Cyperaceae (Sedge family) pollen. Seeds of these taxa may have been ground as well. The plant macrofossil samples, however, lacked charred lily and sedge seeds.

Feature 34, located stratigraphically below Feature 30, had fairly high percentages of Cheno-am pollen indicating that this feature also was associated with the processing of goosefoot. Additionally, seeds of goosefoot and saltbush were found in the feature. Overall, the processing of food plants, especially goosefoot seeds, was an important activity at the Taliaferro site during Component VI times.

Animal Remains

A total of 290 specimens of bone, teeth, and shell was recovered from Component VI (Appendix E). Table 26 presents the number of specimens and the minimum number of individuals by taxa or analytical group. Along with Component IV, this component has the most variety of taxa represented for the site. Ten taxa were identified, including large and small mammal, bird, fish, and mussel. Mule deer is represented by a first phalange fragment and pronghorn by fragments of an atlas, radius, metatarsal, and first phalange. All the specimens grouped as Artiodactyl belong to deer- or pronghorn-sized animals. The anatomical elements of the jackrabbit are a mandible, scapula, and metacarpal. Cottontail bones include an ulna and a femur fragment. Two innominate fragments, two femurs, and a calcaneus were identified as muskrat. A fragment of a humerus and an iliac of a prairie dog and a burned left ischium of a ground squirrel also were recovered. Among the identified sage grouse bone elements are vertebra, scapula, humerus, ulna, femur, tibiotarsus, tarsometatarsus, and first phalange. Sucker remains include a maxilla,

Table 26. Animal remains by taxa, Component VI, Taliaferro site.

Taxon	N	MNI
Mule deer (Odocoileus hemionus)	1	1
Pronghorn (Antilocapra americana)	5	2
Jackrabbit (Lepus sp.)	3	1
Cottontail (Sylvilagus sp.)	2	1
Muskrat (Ondatra zibethicus)	5	1
Prairie dog (Cynomys sp.)	2	1
Ground squirrel (Spermophilus sp.)	1	1
Sage grouse (Centrocercus urophasianus)	31	3
Sucker (Catostomus sp.)	12	1
Artiodactyl	18	-
Lagomorph	1	-
Large mammal	24	-
Medium to large mammal	44	-
Medium mammal	2	-
Small to medium mammal	24	-
Small mammal	108	-
Egg shell	4	-
Mussel shell (Margaritifera sp.)	3	-
Total	290	-

Key: N = Number of identified specimens
MNI = Minimum number of individuals

angular, sphenotic, interopercle, cleithrum, basiterigium, and cranium fragments. The remaining specimens, 71% of the collection, are unidentifiable fragments.

Though both large and small animals are represented, a majority of the specimens are from identified or unidentified small animals. This contrasts with most other components where specimens from large mammals dominate. Of the identified small animals, specimens of sage grouse dominate, and sucker is the second most common taxon. As with Component V, pronghorn and mule deer are the identified large mammals, with pronghorn represented by at least two individuals. Overall, a wide variety of animal species was exploited during Component VI times, including those from upland and riparian environments. The pronghorn, mule deer, rabbits, prairie dog, ground squirrel, and sage grouse probably were obtained from the uplands. The riparian taxa include muskrat, sucker, and mussels, which most likely were acquired from the Green River or possibly Slate Creek.

The larger game probably was hunted at some distance from the site, and only selected portions were brought back for further processing. Most recovered anatomical elements of these animals are portions of hind quarters and distal extremities of the limbs. As with other components at the site, the majority of the recovered bone in Component VI are unidentifiable fragments. This suggests maximum use of these animals. The bone was probably processed for its marrow and juice. Only 45 of the 290 specimens displayed evidence of burning. Evidence for the season of occupation comes from the presence of egg and mussel shells. Sage grouse eggs generally are available in April or May, indicating an occupation during this time of year. Mussels can be collected from the spring through the fall.

The dominance of specimens identified to small animals for Component VI is in contrast to the results from most excavated Late Prehistoric sites in southwest Wyoming. Pronghorn- or deer-sized Artiodactyls are usually the most common taxa represented at these sites, though remains of small animals are recovered as well. Excavated sites with radiocarbon ages similar to Component VI include Component IV at the Maxon Ranch site, 1140 years ago (Harrell and McKern 1986); Component III at 48UT779, 1130 years ago (Schroedl 1985); and Component III at 48SW5019, 1070 years ago (Creasman et al. 1983). At the Maxon Ranch site, 53% of the total identified non-rodent bone was from Artiodactyls, which was mostly pronghorn. Other identified species are jackrabbit, long-tailed weasel, cottontail, and sage grouse. Pronghorn or large mammal specimens dominate the collection from Component III at 48UT779. Also recovered were bones of jackrabbit, cottontail, and bird, as well as bird egg and mussel shell. Bison and pronghorn are among the identified taxa from 48SW5019. Generally a wide variety of animals were exploited during the Late Prehistoric period, though with a slight emphasis on pronghorn.

Spatial Distribution of Remains

The spatial distribution of features, fire-cracked rock, flaked stone tools, groundstone, debitage, and bone was plotted for Component VI. The distribution of the cultural remains was plotted only for the south half of Excavation Area A. The Component VI deposits in the north half were ephemeral and occurred only along the southern and western edges.

Because cultural material belonging to Component VI occurred in 60 cm thick deposits that encompassed the entire Late Prehistoric period, only remains from a single layer were used for the following spatial distributions. The distributions were plotted only for remains that were associated with occupation layer VIb and Feature 30, the possible structure. Deposits representing other Component VI occupations (VIa and VIc) were above and below this layer. Using the single occupation layer with Feature 30 provides an opportunity to examine the types and locations of the prehistoric activities around a posited sheltered feature area.

The distribution of features and fire-cracked rocks is shown in Figure 64. Feature 30, which probably served as a sheltered habitation area, is located in the center of the excavation area. Most of the fire-cracked rocks are scattered to its north and east, the downslope and leeward sides. Feature 29 also occurs in this area. The areas to the north and east of Feature 30 along with Feature 29 probably represent an outside activity area for a family unit (Yellen 1977). In contrast, the west and south sides or the direction of the prevailing wind, have relatively few pieces of fire-cracked rock. Feature 33 is situated along the western edge of the excavation area and is associated with another scatter of fire-cracked rock, of which Fire-cracked Rock Concentration D is part.

Figure 65 shows the distribution of the flaked stone artifacts and groundstone. The density values by square meter for all flaked stone artifacts across the excavation area were smoothed using trend surface analysis (Hodder and Orton 1976:155). According to the trend surface map, flaked stone tools are most dense in the center of the excavation area just northeast of Feature 30. Other dense areas occur southeast of Feature 30 and north of

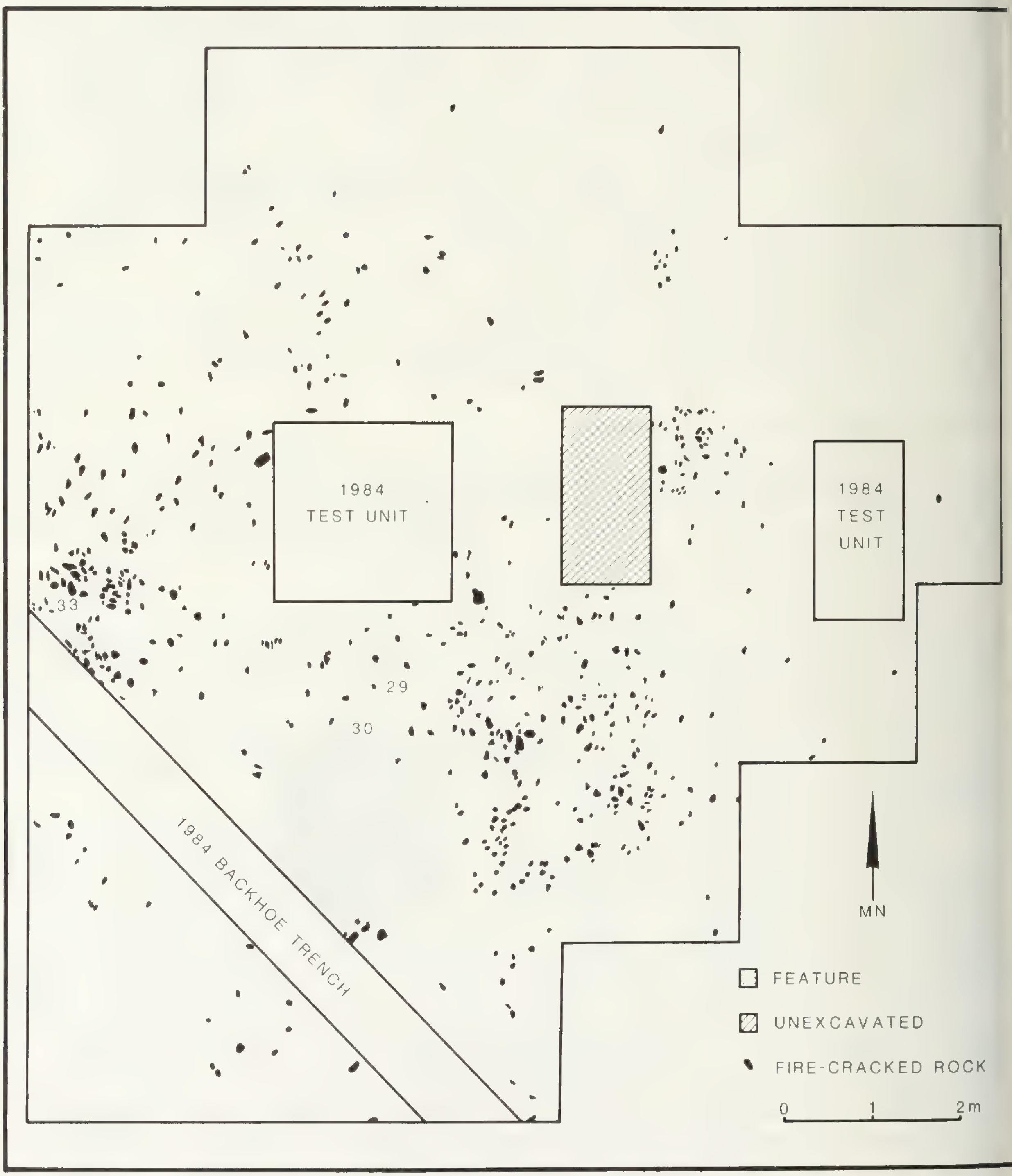


Figure 64. Plan map of the south half of Excavation Area A showing the distribution of features and fire-cracked rock, Component VI, Taliaferro site.

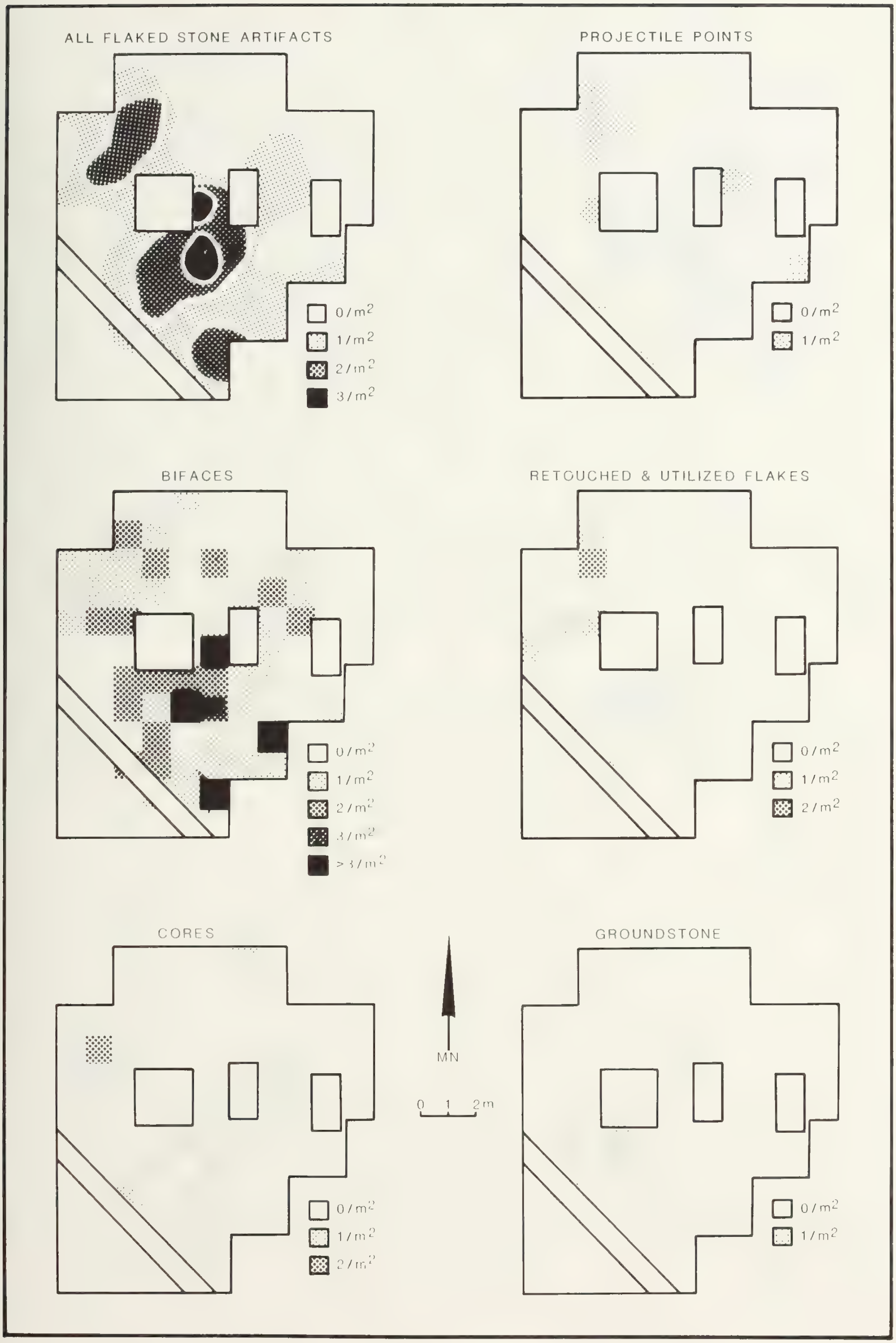


Figure 65. Plan map of the south half of Excavation Area A showing the horizontal distribution of all flaked stone and groundstone tools, Component VI, Taliaferro site.

Feature 33. The distribution of the flaked stone tools is generally similar to that for fire-cracked rocks.

Individual maps were made showing the number per square meter of projectile points, bifaces, retouched and utilized flakes, cores, and groundstone. Insufficient quantities of these artifact types precluded the use of trend surface analysis. The projectile points are scattered throughout the excavation area but tend to be slightly more concentrated in the northwestern corner of the excavation area. The preblanks, blanks, preforms, and unclassifiable bifaces are included on the biface map and appear to follow the distribution of the fire-cracked rocks; however, they are more numerous northeast and southeast of Feature 30. The northwestern corner, just north of Feature 33, contains most of the retouched and utilized flakes. The cores are located just north of Feature 30 as well as in the area north of Feature 33. The groundstone occurs between Features 30 and 33. Overall there appears to be slight differences in the horizontal distribution of these artifact types.

Figure 66 provides trend surface maps for total debitage and individual maps for the various material types. The density peak on the map for total debitage is in the center of the excavation block just north of Feature 30. This corresponds with the one for all flaked stone artifacts. Debitage is also fairly dense along the eastern downslope side of Feature 30. Only minor amounts are in the northwestern corner where many of the flaked stone artifacts occur. The individual trend surface maps of the various material types are similar to the one for total debitage. Except for Whiskey Buttes chert, all other maps display density peaks in the center of the excavation area.

The distribution of animal remains is shown in Figure 67. Trend surface maps were made for the number and weight of bone per square meter. The density peak on the map for number of bone specimens occurs in the center of the excavation area just north of Feature 30. This corresponds with the pattern for debitage and all flaked stone tools. In contrast, the most dense area for weight is in the southeastern corner east of Feature 30. These differences in the distribution of bone indicate that small, fragmentary pieces are concentrated in the center portion and a few relatively large, complete elements occur in the southeastern part of the excavation area. From examination of the density maps broken down to taxa per square meter, the small, fragmentary bone north of Feature 30 consists of numerous pieces of unidentifiable small mammal. The more complete elements in the southeastern corner belong to several taxa. Muskrat, prairie dog, and avian remains are mostly limited to this corner. The few large mammal bones are scattered throughout the excavation area. Mussel shell occurs only between Features 30 and 33.

Generally, the flaked stone artifacts, debitage, and bone are most dense just north of Feature 30, and their distribution follows that for fire-cracked rock. Most likely several types of activities were performed, and the resulting debris was dumped along this leeward side of the sheltered feature. There are, however, minor differences in the spatial patterning of some of the artifact types and kinds of bone. Projectile points and retouched and utilized flakes are more numerous in the area north of Feature 33. The greatest variety of animal remains identifired to taxa is southeast of Feature 30.

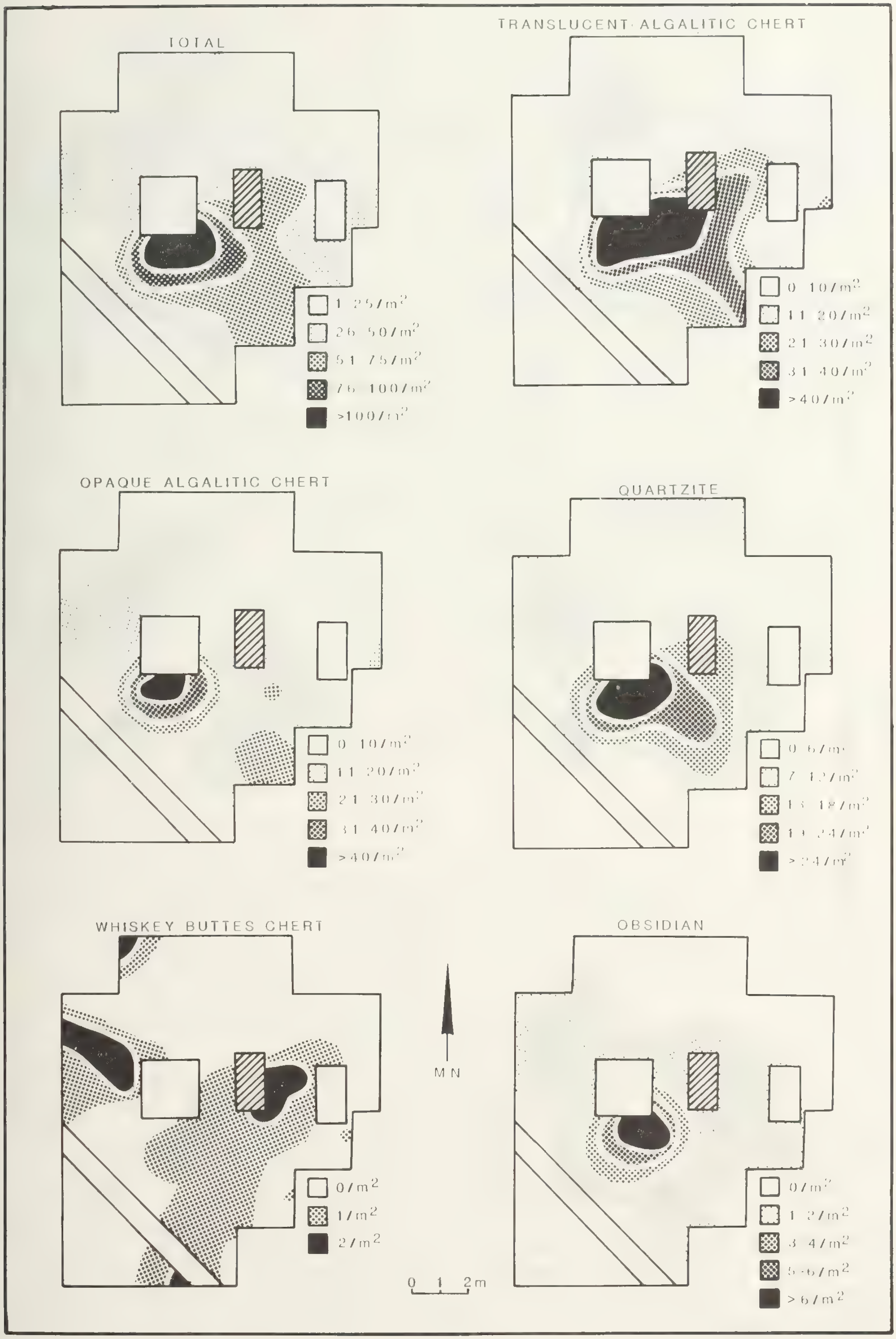


Figure 66. Plan map of the south half of Excavation Area A showing the horizontal distribution of total debitage and material types, Component VI, Taliaferro site.

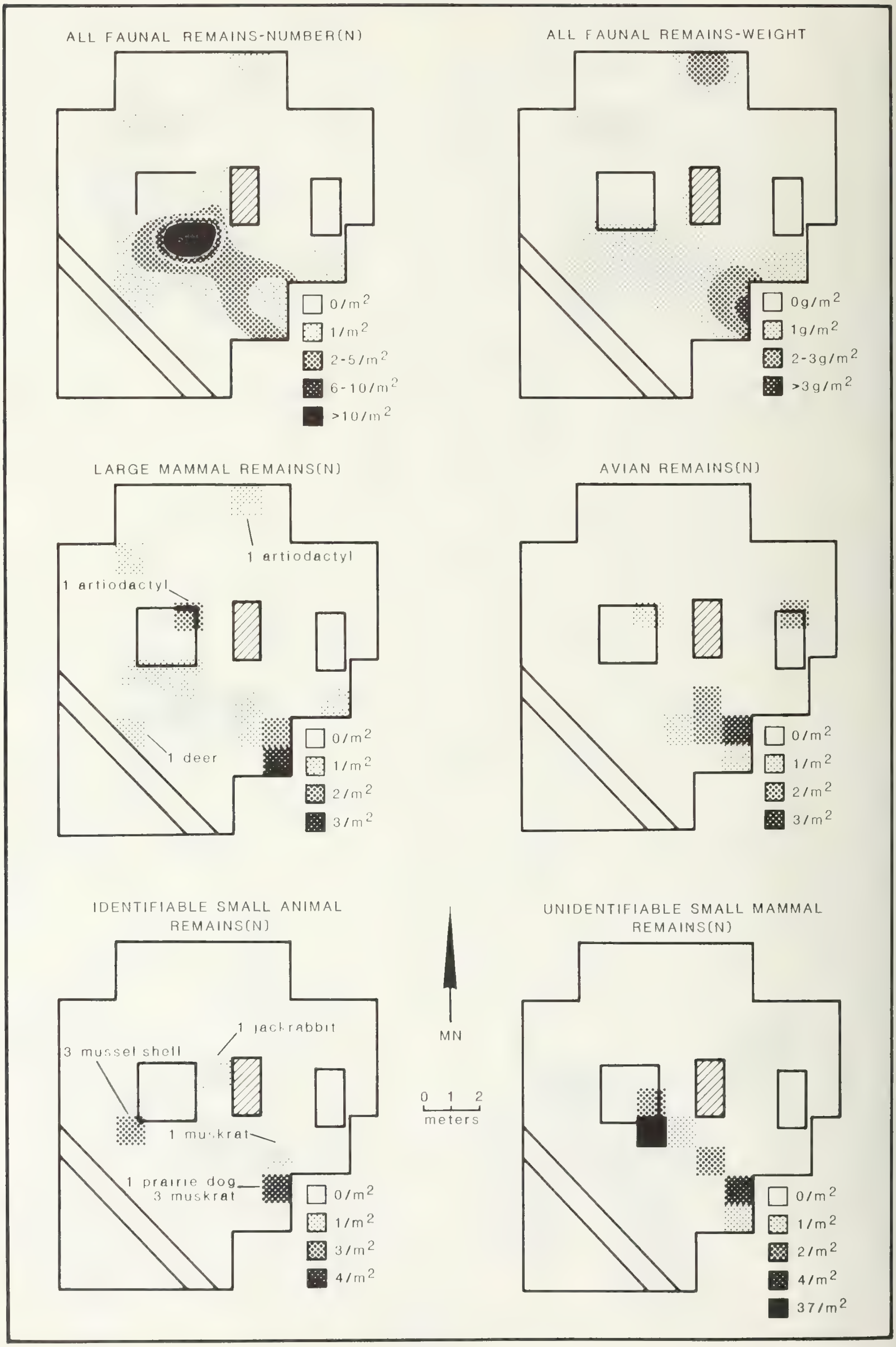


Figure 67. Plan maps of the south half of Excavation Area A showing the horizontal distribution of animal remains, Component VI, Taliaferro site.

Component VII

The Late Prehistoric Component VII is present throughout Excavation Area B just above the Component V deposits. Horizontally it includes 92 m² of excavated area. A layer of fire-cracked rock located just above the midden delineates the component, which includes deposits to the present ground surface in most places. The component dates to 960 years ago.

Features

Three pit features were present in Component VII: two were irregular-shaped pits, Features 1 and 2, and one was a rock-filled basin, Feature 22 (Table 27). The two irregular-shaped pits had an irregular plan view, shallow cross section, and oxidation on the bottom. They contained large amounts of charcoal and an extremely dark fill. Figure 68 shows Feature 1 before excavation. Feature 1 yielded four taxa of charred seeds and Feature 2 had six. Goosefoot (Chenopodium sp.) dominated the macrofossil assemblages from both features.

The remaining pit feature for the Component was a small, rock-filled basin, Feature 22. It was stratigraphically above Feature 9, the bell-shaped pit from Component V, and had six fire-cracked rocks scattered throughout a dark fill containing large amounts of charcoal (Figure 69). The feature lacked charred plant macrofossils but contained eight bone wall fragments from unidentifiable small mammals. Some of these fragments were burned. Charcoal from the rock-filled pit produced a radiocarbon age of 960 years ago.

The presence of oxidation and large amounts of charcoal in the two irregular-shaped pits indicates in-place burning. Along with other features of this type from the Taliaferro site, these pits probably were minimally prepared firepits that were used on a single occasion. The rock-filled basin most likely functioned as a pit for heating rocks to be used in cooking or roasting activities.

Flaked Stone Artifacts

A total of 237 flaked stone tools and 17,289 pieces of debitage was recovered from Component VII deposits. Tools include 23 projectile points, 2 drills, 12 final biface tips, 83 preforms and fragments, 20 blanks, 28 pre-blanks, 36 indeterminate bifaces, 7 retouched flakes, 14 utilized flakes, 4 modified cobbles or pebbles, and 8 cores (Table 28). An example of the flaked stone artifact assemblage from Component VII is illustrated in Figures 70 and 71.

The projectile points belonging to Component VII were classified as Type I lanceloate, Type I bifurcate-stemmed, large corner-notched, small corner-notched, and small side-notched. The Type I lanceloate point from Component VII may have been picked up for reuse and most likely originated from the Middle Archaic Component II. Similar points roughly date between 5000 and 3000 years ago (Frison 1978; Mulloy 1954). The Type I bifurcate-stemmed points normally date between 5000 and 3000 years ago, and the one from Component VII probably originated in the Middle Archaic Component II. Corner-notched points usually are assigned to the Pelican Lake type on the Northwestern Plains and to the Elko series in the Great Basin (Heizer and Baumhoff 1961; Wettlaufer 1955). Five of the large, corner-notched points from the Taliaferro site are associated with the Late Archaic Component III, which is consistent with the age of the Pelican Lake type of the Northwestern Plains. Elko Corner-notched points have a long time span in the Great Basin and occur in most cultural components ranging from 6800 to 400 years ago at the Deadman

Table 27. Characteristics of pit features, Component VII, Taliaferro site.

Feature No.	Type	Volume (liter)	Area (cm^2)	Artifacts	Debitage (total)	Bone No.	Bone wt.(g)	Plant Macro-fossils[a]	Charcoal[b]
1	Irregular-shaped	11.5	1963.5	Preform	8	-	-	4	much
2	Irregular-shaped	26.0	5026.5	Preform	7	-	-	6	much
22	Rock-filled	11.0	1256.5	-	14	8	0.3	0	much

[a]Number of taxa

[b]Relative amount

Wash site in southwest Wyoming (Creasman 1984). However, the large, corner-notched point for Component VII probably originated in Component III and was picked up for reuse.

Seventeen small, corner-notched points were recovered: 12 are of translucent algalitic chert, 2 are of opaque algalitic chert, and 3 are of obsidian. Except for Component VIII, the points are common in all the Late Prehistoric components at the Taliaferro site. The small, corner-notched points from the Taliaferro site date between 1500 and 960 years ago, which is consistent with their age in nearby regions. Several sites in southwest Wyoming dating to the Late Prehistoric period contain Rose Spring points, including Austin Wash (Schroedl 1985), 48SW1242 (Hoefer 1986), Cow Hollow Creek (Schock et al. 1982) and Sheehan (Bower et al. 1984).

Three small, side-notched points are associated with Component VII. These points resemble the Uinta Side-notched type that is common at Fremont sites dating between 1150 and 750 years ago (Holmer and Weder 1980). They also are similar to the Prairie Side-notched type with an age of about 1250 to 650 years ago on the Northern Plains (Kehoe 1966). In southwest Wyoming, small, side-notched points are the most common point type at the Wardell Buffalo Trap (Frison 1973). The three from Component VII correspond in age to the temporal span of the small side-notched in the region.

The two drills from Component VII are of translucent and opaque algalitic chert. One is a bit (midsection) that is missing the tip. The other exhibits three notches: one is on each of the lateral margins and another is on the center of the proximal edge. It was probably a small preform which was notched and reworked at the tip.

The 12 final biface tips recovered are probably distal portions of projectile points. Of the four large preforms, three are of quartzite, and one is of opaque algalitic chert. The remaining five complete preforms are small preform Types IIa, IIb, and IV. These five are part of the flake stone artifact assemblage of the Late Archaic Component III and the Late Prehistoric Components IV-VII. The only Type IV preform belongs to Component VII and is the only artifact of Church Buttes chert from the entire excavation. It is about the size and shape of the Desert Side-notched projectile point, but without notches. By far, most (n=74) of the recovered preforms are fragments. Preform fragments make up 31.2% of the total number of flaked stone artifacts. Small preforms are common at Late Prehistoric sites throughout the region,

Figure 68. Feature 1, an irregular-shaped pit, before excavation, Component VII, Taliaferro site.

Figure 69. Feature 22, a rock-filled basin from Component VII, and Feature 9, a bell-shaped pit from Component V, showing their stratigraphic relationship, Taliaferro site.

Table 28. Crosstabulation of flaked stone artifact type by material type, Component VII, Taliaferro site.

Artifact Type		Material Type							
		Trans-lucent Chert	Opaque Chert	Quartzite	Moss Agate	Whiskey Buttes Chert	Obsidian	Church Buttes Chert	Total
Large, Lanceolate Point, Type I	#	1	0	0	0	0	0	0	1
	Row %	100.0	0	0	0	0	0	0	0.4
	Column %	0.8	0	0	0	0	0	0	
	Total %	0.4	0	0	0	0	0	0	
Large, Bifurcate-Stemmed Point, Type I	#	0	0	1	0	0	0	0	1
	Row %	0	0	100.0	0	0	0	0	0.4
	Column %	0	0	2.6	0	0	0	0	
	Total %	0	0	0.4	0	0	0	0	
Large, Corner-Notched Point	#	0	1	0	0	0	0	0	1
	Row %	0	100.0	0	0	0	0	0	0.4
	Column %	0	1.6	0	0	0	0	0	
	Total %	0	0.4	0	0	0	0	0	
Small, Corner-Notched Point	#	12	2	0	0	0	3	0	17
	Row %	70.6	11.8	0	0	0	17.6	0	7.2
	Column %	10.0	3.1	0	0	0	42.9	0	
	Total %	5.1	0.8	0	0	0	1.2	0	
Small, Side-Notched Point	#	1	1	0	0	0	1	0	3
	Row %	33.3	33.3	0	0	0	33.3	0	1.3
	Column %	0.8	1.6	0	0	0	14.3	0	
	Total %	0.4	0.4	0	0	0	0.4	0	
Drill	#	1	1	0	0	0	0	0	2
	Row %	50.0	50.0	0	0	0	0	0	0.8
	Column %	0.8	1.6	0	0	0	0	0	
	Total %	0.4	0.4	0	0	0	0	0	
Final Biface Tip	#	7	3	2	0	0	0	0	12
	Row %	58.3	25.0	16.7	0	0	0	0	5.1
	Column %	5.8	4.7	5.3	0	0	0	0	
	Total %	3.0	1.3	0.8	0	0	0	0	
Large Preform	#	0	1	3	0	0	0	0	4
	Row %	0	25.0	75.0	0	0	0	0	1.7
	Column %	0	1.6	7.9	0	0	0	0	
	Total %	0	0.4	1.3	0	0	0	0	
Small Preform, Type IIa	#	1	0	0	0	0	0	0	1
	Row %	100.0	0	0	0	0	0	0	0.4
	Column %	0.8	0	0	0	0	0	0	
	Total %	0.4	0	0	0	0	0	0	
Small Preform, Type IIb	#	1	1	0	0	0	1	0	3
	Row %	33.3	33.3	0	0	0	33.3	0	1.3
	Column %	0.8	1.6	0	0	0	14.3	0	
	Total %	0.4	0.4	0	0	0	0.4	0	
Small Preform, Type IV	#	0	0	0	0	0	0	1	1
	Row %	0	0	0	0	0	0	100.0	0.4
	Column %	0	0	0	0	0	0	100.0	
	Total %	0	0	0	0	0	0	0.4	

Table 28. Continued.

Artifact Type		Trans-lucent Chert	Opaque Chert	Quartzite	Moss Agate	Whiskey Buttes Chert	Obsidian	Church Buttes Chert	Total
		Material Type							
Preform Fragment	#	44	24	3	1	2	0	0	74
	Row %	59.5	32.4	4.0	1.4	2.7	0	0	31.2
	Column %	36.4	37.5	7.9	100.0	40.0	0	0	
	Total %	18.6	10.1	1.2	0.4	0.8	0	0	
Blank	#	10	6	3	0	1	0	0	20
	Row %	50.0	30.0	15.0	0	5.0	0	0	8.4
	Column %	8.3	9.4	7.9	0	20.0	0	0	
	Total %	4.2	2.5	1.3	0	0.4	0	0	
Preblank	#	16	8	4	0	0	0	0	28
	Row %	57.1	28.6	14.3	0	0	0	0	11.8
	Column %	13.2	12.5	10.5	0	0	0	0	
	Total %	6.8	3.4	1.7	0	0	0	0	
Indeterminate Biface	#	19	11	3	0	2	1	0	36
	Row %	52.8	30.6	8.3	0	5.6	2.8	0	15.2
	Column %	15.7	17.2	7.9	0	40.0	14.3	0	
	Total %	8.0	4.6	1.3	0	0.8	0.4	0	
Distal Retouched Flake, Type II	#	1	1	0	0	0	0	0	2
	Row %	50.0	50.0	0	0	0	0	0	0.8
	Column %	0.8	1.6	0	0	0	0	0	
	Total %	0.4	0.4	0	0	0	0	0	
Distal Retouched Flake, Type III	#	0	0	1	0	0	0	0	1
	Row %	0	0	100.0	0	0	0	0	0.4
	Column %	0	0	2.6	0	0	0	0	
	Total %	0	0	0.4	0	0	0	0	
Lateral Retouched Flake, Type I	#	1	0	0	0	0	0	0	1
	Row %	100.0	0	0	0	0	0	0	0.4
	Column %	0.8	0	0	0	0	0	0	
	Total %	0.4	0	0	0	0	0	0	
Serrated Flake	#	1	0	0	0	0	0	0	1
	Row %	100.0	0	0	0	0	0	0	0.4
	Column %	0.8	0	0	0	0	0	0	
	Total %	0.4	0	0	0	0	0	0	
Graver	#	0	0	1	0	0	0	0	1
	Row %	0	0	100.0	0	0	0	0	0.4
	Column %	0	0	2.6	0	0	0	0	
	Total %	0	0	0.4	0	0	0	0	
Irregular Retouched Flake	#	0	0	0	0	0	1	0	1
	Row %	0	0	0	0	0	100.0	0	0.4
	Column %	0	0	0	0	0	14.3	0	
	Total %	0	0	0	0	0	0.4	0	
Utilized Flake	#	4	4	6	0	0	0	0	14
	Row %	28.6	28.6	42.9	0	0	0	0	5.9
	Column %	3.3	6.3	15.8	0	0	0	0	
	Total %	1.7	1.7	2.5	0	0	0	0	
Modified Cobble	#	0	0	4	0	0	0	0	4
	Row %	0	0	100.0	0	0	0	0	1.7
	Column %	0	0	10.5	0	0	0	0	
	Total %	0	0	1.7	0	0	0	0	

Table 28. Concluded.

Artifact Type		Trans-lucent Chert	Opaque Chert	Quartzite	Moss Agate	Whiskey Buttes Chert	Obsidian	Church Buttes Chert	Total
		Material Type							
Residual Core	#	1	0	6	0	0	0	0	7
	Row %	14.3	0	85.7	0	0	0	0	3.0
	Column %	0.8	0	15.8	0	0	0	0	
	Total %	0.4	0	2.5	0	0	0	0	
Multidirectional Core	#	0	0	1	0	0	0	0	1
	Row %	0	0	100.0	0	0	0	0	0.4
	Column %	0	0	2.6	0	0	0	0	
	Total %	0	0	0.4	0	0	0	0	
Total	#	121	64	38	1	5	7	1	237
	%	51.1	27.0	16.0	0.4	2.1	3.0	0.4	100.0

including the Austin Wash site (Schroedl 1985) and the Sheehan site (Bower et al. 1986).

Half of the 20 blanks are of translucent algalitic chert, and opaque algalitic chert is the second most common material type. Most of the preblanks are of translucent algalitic chert as well. This distribution of material type for the blanks and preblanks corresponds to that of the preforms and projectile points from the component. The 36 indeterminate (unclassifiable) bifaces also are predominantly translucent algalitic chert.

The seven retouched flakes are Types II and III distal retouched, a Type I lateral retouched, a serrated flake, a graver, and an irregular retouched flake. Each of these types of retouched flakes occur in most components at the site. Distal and lateral retouched flakes also are present at other Late Prehistoric sites in the area, including the Austin Wash site (Schroedl 1985). The only serrated flake was recovered from Component VII. The irregular retouched flake is of obsidian.

The 14 utilized flakes are almost evenly distributed among translucent and opaque algalitic chert and quartzite. Except for the Early Archaic Component I, Component VII produced the most modified quartzite cobbles and pebbles for the site. Of the eight cores, seven are residual and one is multidirectional.

As with most components at the Taliaferro site, bifacial reduction was the favored technique for flaked stone tool production during Component VII times. The recovery of preblanks, blanks, preforms, and final tool forms indicates that all stages in the bifacial reduction sequence were performed at the site. Most of the preforms are incomplete and probably were broken and rejected during manufacture. Figure 72 illustrates the horizontal distribution of the broken artifact (biface) that was refitted.

A majority (51.1%) of the flaked stone artifacts are of translucent algalitic chert, and the next most common material type is opaque algalitic chert. The heavy reliance on algalitic chert for toolstone occurs throughout the Late Prehistoric period at the Taliaferro site. In contrast, quartzite was the favored material type for the Early Archaic Component I, and the artifacts are more evenly distributed among the algalitic cherts and quartzite for the Middle and Late Archaic Components II and III.

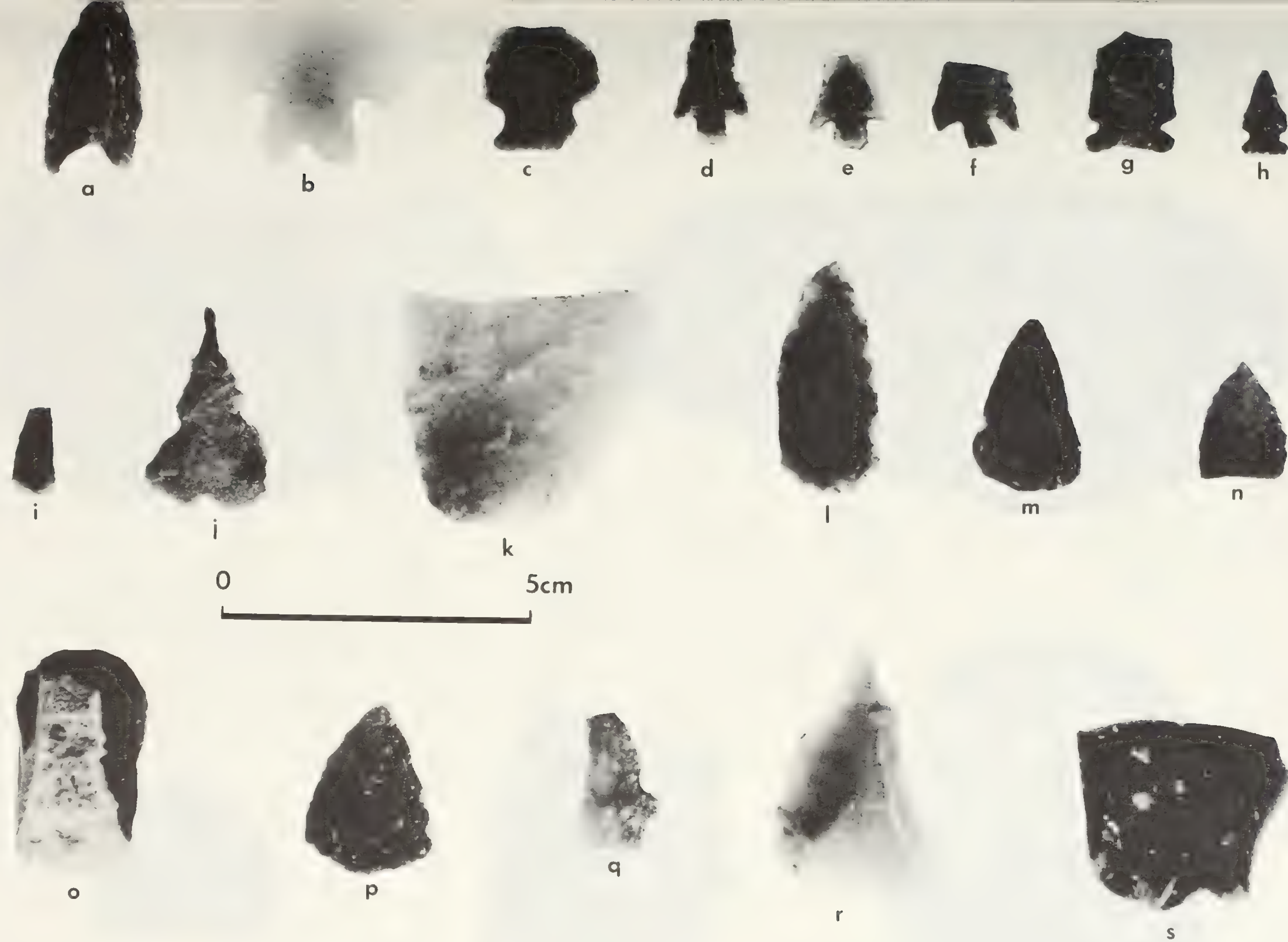


Figure 70. Example of flaked stone artifact assemblage from Component VII, Taliaferro site. a, Large, lanceolate projectile point, Type I; b, Large, bifurcate-stemmed projectile point, Type I; c, Large, corner-notched projectile point; d-f, small, corner-notched projectile point; g-h, Small, side-notched projectile point; l-j, Drill; k, Large preform; l, Small preform, Type IIa; m, Small preform, Type IIb; n, Small preform, Type IV; o-p, Distal retouched flake, Type II; q, Serrated flake; r, Graver; s, Lateral retouched flake, Type I.

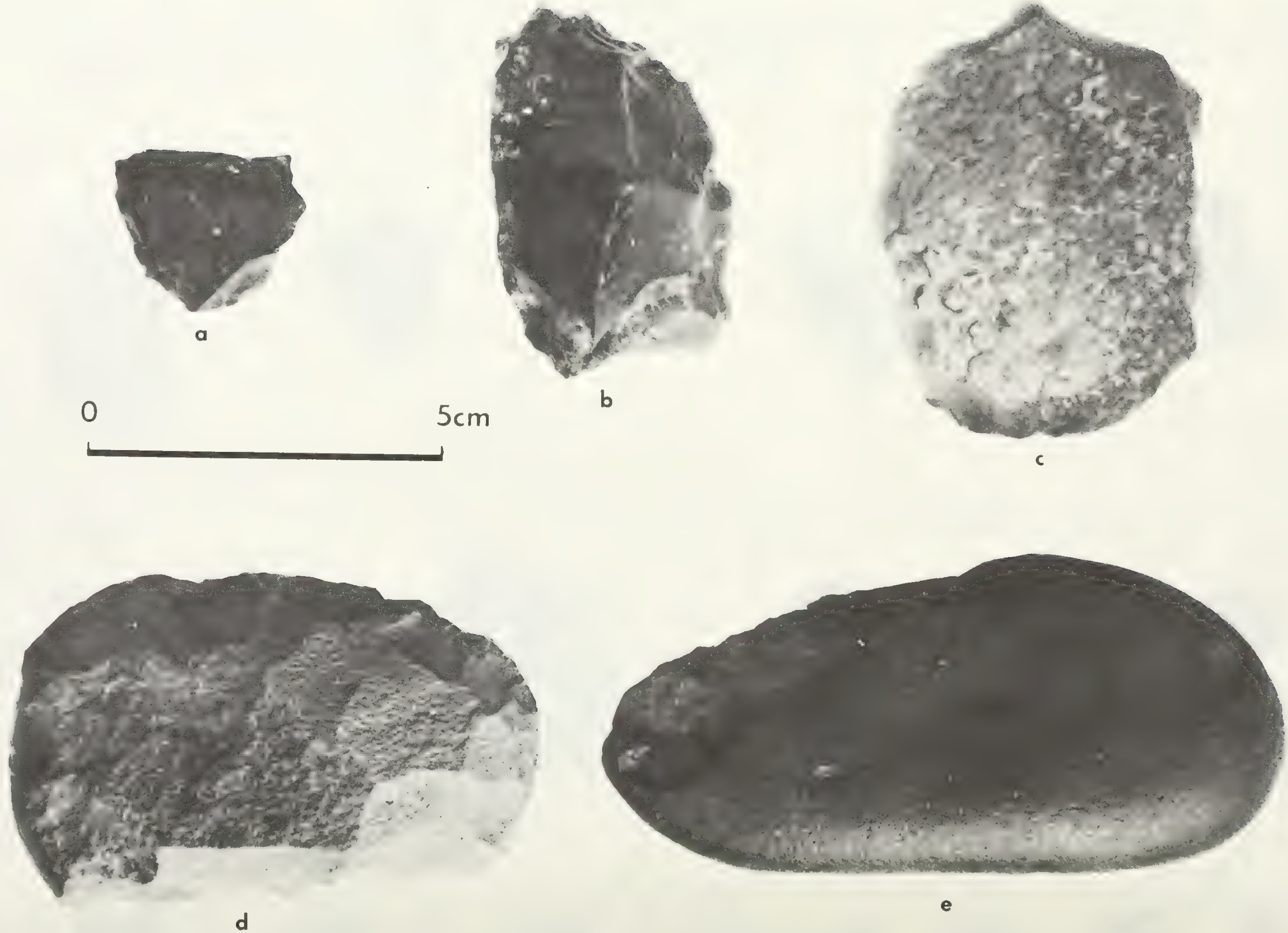


Figure 71. Example of flaked stone artifact assemblage from Component VII, Taliaferro site. a, Blank; b, Preblank; c, Distal retouched flake, Type III; d-e, Modified cobble.

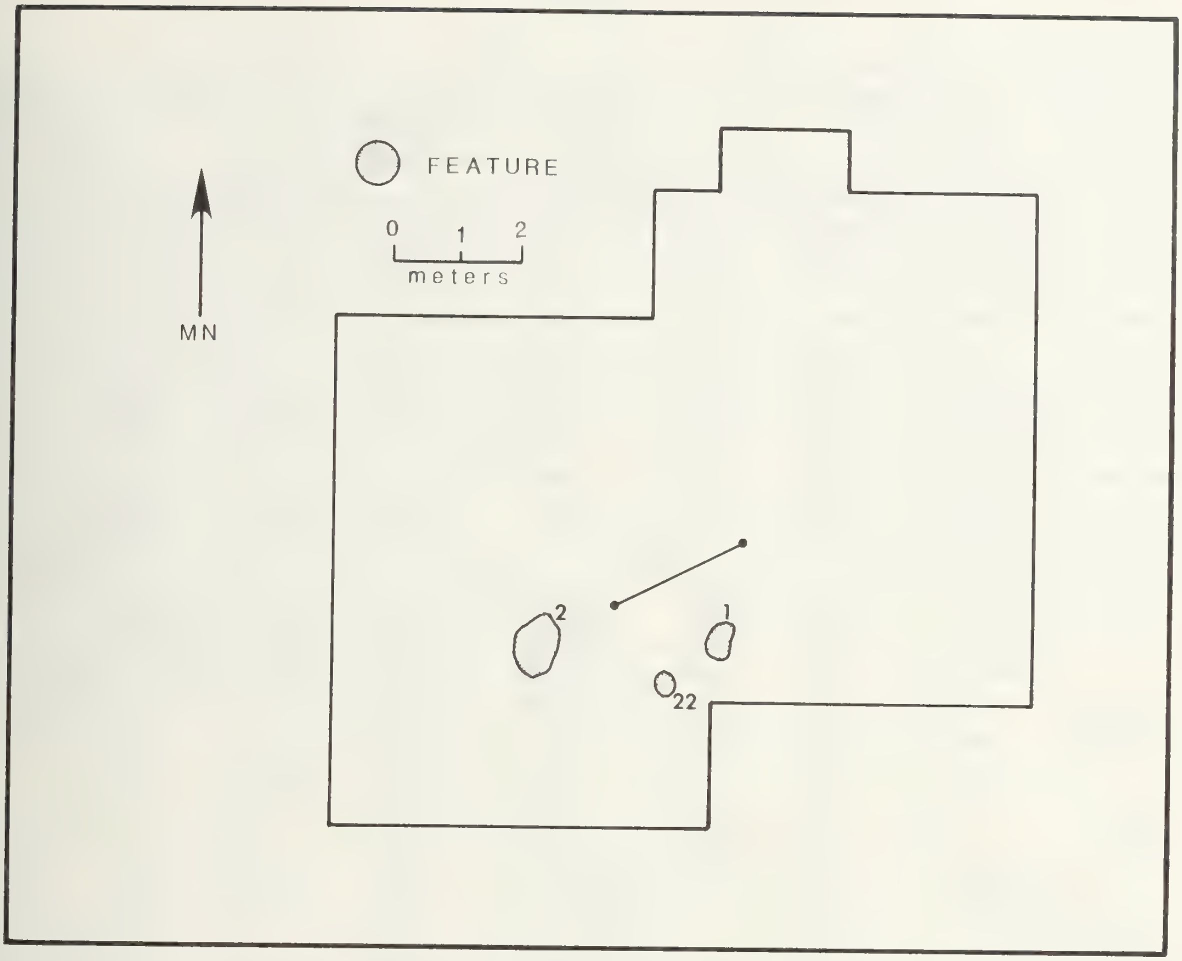


Figure 72. Plan map of Excavation Area B showing the horizontal distribution of the broken artifact that was refitted, Component VII, Taliaferro site.

The crosstabulation of debitage type by material type is detailed in Table 29. Translucent algalitic chert is the dominant material type accounting for 49.3% of the total. There is a slightly higher percentage for opaque algalitic chert (27.6%) than for quartzite (19.7%) debitage. This distribution of debitage material type corresponds to that of the Late Prehistoric Components IV, V, and VIII as well. For the Late Prehistoric Component VI, the three material types are more evenly distributed. The frequencies of debitage material types are similar to the percentages for the flaked stone artifacts belonging to Component VII, which indicates that artifacts of all material types were entirely manufactured at the site.

The majority of the debitage (57.3%) consists of tertiary flakes. Secondary flakes are represented by 22.4% and primary flakes by 10.3%. As is shown in Appendix B, these percentages correspond to the expected ratio of flake types if all stages in the bifacial reduction sequence were performed at the site. This ratio is similar for all components, indicating that the cobbles occurring in the vicinity of the site were completely reduced at the locality. The recovery of bifaces belonging to all stages of production provides additional supportive evidence. All components tend to have higher percentages of tertiary flakes of quartzite than of translucent algalitic chert; the latter is usually represented by more secondary flakes.

Table 29. Crosstabulation of debitage type by material type, Component VII, Taliaferro site.

Flake Type		Material Type						
		Trans- lucent Chert	Opaque Chert	Quartzite	Whiskey Buttes Chert	Obsidian	Other	Total
Primary	#	1057	333	323	25	29	8	1775
	Row %	59.55	18.76	18.20	1.41	1.63	0.45	10.27
	Column %	12.41	6.98	9.49	8.90	11.98	11.59	
	Total %	6.11	1.93	1.87	0.14	0.17	0.05	
Secondary	#	2546	723	479	51	50	15	3864
	Row %	65.89	18.71	12.40	1.32	1.29	0.39	22.35
	Column %	29.88	15.15	14.07	18.15	20.66	21.74	
	Total %	14.73	4.18	2.77	0.29	0.29	0.09	
Tertiary	#	4195	3189	2172	172	146	40	9914
	Row %	42.31	32.17	21.91	1.73	1.47	0.40	57.34
	Column %	49.24	66.81	63.81	61.21	60.33	57.97	
	Total %	24.26	18.45	12.56	0.99	0.84	0.23	
Bifacial Thinning	#	357	129	44	3	8	1	542
	Row %	65.87	23.80	8.12	0.55	1.48	0.18	3.13
	Column %	4.19	2.70	1.29	1.07	3.31	1.45	
	Total %	2.06	0.75	0.25	0.02	0.05	0.01	
Shatter	#	331	376	379	30	9	4	1129
	Row %	29.32	33.30	33.57	2.66	0.80	0.35	6.53
	Column %	3.88	7.88	11.13	10.68	3.72	5.80	
	Total %	1.91	2.17	2.19	0.17	0.05	0.02	
Tested Material	#	34	23	7	0	0	1	65
	Row %	52.31	35.38	10.77	0.00	0.00	1.54	0.38
	Column %	0.40	0.48	0.21	0.00	0.00	1.45	
	Total %	0.20	0.13	0.04	0.00	0.00	0.01	
Total	#	8520	4773	3404	281	242	69	17,289
	%	49.28	27.61	19.69	1.63	1.40	0.40	100.00

Other Artifacts

Six hammerstones and 16 pieces of groundstone were recovered from Component VII deposits (Appendix B). Except for one, which is of translucent algalitic chert, the hammerstones are of quartzite. The groundstone implements include an abrading stone, two shaped manos, an unshaped mano, five slab metates, an unshaped slab metate, and six indeterminate groundstone fragments. The abrading stone is made of sandstone and has a single longitudinal groove down the middle of one surface. The shaped manos are unifacially ground or pecked. The unshaped mano is complete and is unifacially ground and pecked. Three of the shaped metates are bifacially ground and pecked, and two are unifacially ground. The one unshaped metate is unifacially ground.

Component VII yielded the most hammerstones for the site, though more hammerstones displaying less evidence of use may have went unnoticed during the excavations for each component. The abrading stone from this component was the only one recovered during the excavations. Others have been found at Late Prehistoric sites in southwest Wyoming, such as the Austin Wash site (Schroedl 1985) and the Wardell Buffalo Trap (Frison 1973). The groundstone artifact assemblage from Component VII is similar to those of the other Late Prehistoric components, except with slightly more variety. Grinding implements occur at most excavated sites belonging to the Late Prehistoric period in southwestern Wyoming. The feature fill from several of these sites, including the Taliaferro site, has consistantly yielded charred plant macrofossils as well. This evidence indicates that the collecting and processing of plant forbs was an important activity during the Late Prehistoric.

Plant Macrofossils

A sample of the fill from east of the three pit features (Features 1, 2, and 22) from Component VII was floated and examined for plant macrofossils (Appendix C). A total of 42 charred seeds was recovered from two of the features; Feature 22 lacked seeds (Table 30). Goosefoot (Chenopodium sp.) is the dominant taxon in the two features. Each of the other taxa are represented by only one or two charred seeds. These taxa include saltbush (Atriplex sp.), monolepis (Monolepis nuttalliana), cinquefoil (Potentialla sp.), sagebrush (Artemisia sp.), sedge (Carex sp.), Indian ricegrass (Oryzopsis hymenoides), and lily (Liliaceae). This is the only occurrence of the cinquefoil and sagebrush seeds at the site.

Though in smaller quantities, the taxa recovered from Component VII are similar to those of the other Late Prehistoric components. These assemblages are dominated by weedy, pioneer species that thrive in recently disturbed areas. Other species represented in this component, such as sedge and cinquefoil, grow in the riparian community along Slate Creek in the vicinity of the Taliaferro site. Spiny hopsage (Atriplex spinosa) and Indian ricegrass occur on the ridge top. The seeds from most of these taxa are available in the late summer and fall, August and September, suggesting an occupation for the component at least during this time of year. The presence of charred seeds identified to the lily family indicates that the site was occupied as early as June.

Pollen

Samples from the fill of the three features, one sample from an occupation floor, and washes from the surface of three pieces of groundstone were processed and counted for pollen (Appendix D). Features 1 and 2 and Feature 22 were examined as was the occupation floor next to Feature 2. The three pieces of groundstone (SCL14.645, .715, and .716) are shaped slab metates recovered from the area between the features.

The sample from Feature 2 has a fairly high percentage of Cheno-am (goosefoot and amaranth families) pollen, but the sample taken from the occupation floor just north of the feature has the highest Cheno-am frequency for the component. The percentage of greasewood (Sarcobatus sp.) pollen is higher in the feature fill sample than in the occupation floor sample. Feature 2 also produced goosefoot seeds. The evidence would suggest that goosefoot seeds were processed in the vicinity of the feature and greasewood was used as fuel in the feature. For Feature 1, the Cheno-am pollen frequency is lower than that for the two samples associated with Feature 2, but aggregates still are present. Seeds of taxa in the Chenopodiaceae (goosefoot) family were recovered from the fill of Feature 1 as well. Additionally, pollen of the lily (Liliaceae) family and of cattail (Typha angustifolia-type) were noted in the sample for Feature 1. These plants may have been processed near the feature. Further evidence for the use of lili comes from the Feature 2 plant macrofossil assemblage. Feature 2 contains cattail pollen as well. Feature 22, which lacked charred seeds, has fairly high percentages of

Table 30. Summary of plant macrofossils recovered from Component VII, Taliaferro site.

Feature No.	Volume of Sample (liter)	Percent[a]	Number of Charred Seeds	Plant Taxon (in order of greatest frequencies)
1	1.5	13	11	Goosefoot, saltbush, monolepis, sedge
2	7.5	29	31	Goosefoot, Indian ricegrass, lily family, saltbush, cinquefoil, sagebrush
22	2.5	23	0	None

[a]Percent examined of total feature volume

Cheno-am pollen with aggregates. This suggests that goosefoot was processed near the feature.

The three shaped slab metates have almost identical percentages and types of pollen. The Cheno-am frequencies in these metate samples are the lowest for Component VII. The percentages of the other pollen types represented in the samples correspond to the natural pollen rain and lack evidence of the kinds of plants ground. As with the other Late Prehistoric components, the processing of plants, especially the seeds, was an important activity at the site during Component VII times.

Animal Remains

A total of 239 specimens of bone, teeth, and shell was recovered from Component VII (Appendix E). Table 31 presents the number of specimens and the minimum number of individuals by taxa or analytical group. Six taxa were identified, including bison, mule deer, pronghorn, jackrabbit, cottontail, and freshwater mollusks. Bison is represented by a third phalange fragment and mule deer by a right acatabulum fragment. The anatomical elements of pronghorn are a sphenoid; a first, second, and third phalange; a fetal pubis, and several tooth fragments. Except for one large specimen, all those grouped as Artiodactyl are the size of pronghorn or deer. Jackrabbit elements include vertebra, humerus, ulna, and metatarsal bones. An ulna and tibia fragment of a cottontail also were recovered. The remaining specimens, 77% of the collection, are unidentifiable fragments.

As with most components, specimens of large mammals dominate the collection. There is less variety of taxa than in the Late Prehistoric Components IV and VI, although all three large mammals used at the site, bison, mule deer, and pronghorn, are represented in this component. Of the three large mammal species based on MNI counts, pronghorn appears to have been the most emphasized in the subsistence base. Jackrabbit, represented by two individuals, is the most common small animal. Evidence for the continued use of riparian environments comes from the presence of mussel shells in the colletion. Except for tooth enamel, all identified anatomical elements of the large mammals are portions of the hind quarters and distal limb extremities. Most likely, the prehistoric inhabitants during this period obtained these animals in areas removed from the site and brought back only selected pieces.

The fragmentary nature of the collection from Component VII indicates that the selected portions of the animals brought back to the site were used to their maximum potential. In addition to the meat procured, bone probably

Table 31. Animal remains by taxon, Component VII, Taliaferro site.

Taxon	N	MNI
Bison (*Bison bison bison*)	1	1
Mule deer (*Odocoileus hemionus*)	1	1
Pronghorn (*Antilocapra americana*)	21	2
Jackrabbit (*Lepus* sp.)	8	2
Cottontail (*Sylvilagus* sp.)	3	1
Artiodactyl	19	-
Lagomorph	1	-
Large mammal	64	-
Medium to large mammal	76	-
Medium mammal	20	-
Small to medium mammal	8	-
Small mammal	15	-
Mussel shell (*Margaritifera* sp.)	2	-
Total	239	-

Key: N = Number of identified specimens
MNI = Minimum number of individuals

was processed for its marrow, grease, and juice. Most recovered bone from all components at the Taliaferro site, as well as from most excavated non-kill sites in southwest Wyoming, consists of unidentifiable fragments. Only 45 of the 239 specimens were burned, which suggests that these few fragments were exposed to fire accidentally during disposal. The presence of a fetal pronghorn pubis in the collection provides some evidence of the season of site use. The peak birthing season for pronghorn is the first week in June, suggesting an occupation for the site between early May and late June. Additional clues are provided by the recovery of mussel shells. Freshwater mollusks can be collected from spring through the fall.

Generally, the emphasis on pronghorn in the diet supplemented with small animals, such as jackrabbit, during Component VII times is in agreement with the results from other excavated Late Prehistoric period sites in southwest Wyoming. However, few excavated Late Prehistoric sites in southwest Wyoming have radiocarbon ages as recent as 960 years ago, the age of Component VII. Among the limited animal remains from 48SW5377, with an age of 980 years ago, were pronghorn and rabbit bones (Harrison 1986). In contrast, the Wardell Buffalo Trap, with a radiocarbon age of 990 years ago for the upper layer of the kill area, is primarily a bison kill and processing locality that is quite different from most sites in the region (Frison 1973). In addition to bison, a few specimens identified to dog, pronghorn, jackrabbit, cottontail, pika, and sage grouse were recovered from the upper component at Wardell.

Spatial Distribution of Remains

The spatial distribution of features, fire-cracked rock, flaked stone artifacts, groundstone, debitage, and bone was plotted for Component VII. The distribution of features and fire-cracked rocks are shown in Figure 73. The

Figure 73. Plan map of Excavation Area B showing distribution of features and fire-cracked rock Component VII, Taliaferro site.

three pit features are grouped within 4 m² area in the southwestern portion of the excavation area. Except for the northeastern corner, fire-cracked rocks are generally scattered throughout the excavation block. Another area lacking rocks occurs just north of the features. The density of fire-cracked rock around the edges of the rock free zone is generally high, suggesting the possible location of work areas.

Figure 74 shows the distribution of the flaked stone tools and groundstone. The density values by square meter for all flaked stone artifacts across the excavation area were smoothed using trend surface analysis (Hodder and Orton 1976:155). The trend surface map indicates three high density peaks for all flaked stone tools. One peak is situated between Features 2 and 22, another is northeast of the features, and the third is located in the northwest corner of the excavation area. The distribution of the artifacts follows the general pattern for fire-cracked rock. Both have low frequencies in the north and eastern portion of the excavation block.

Individual distribution maps were made showing the number per square meter of projectile points, bifaces, retouched and utilized flakes, cores, and groundstone. Insufficient quantities of these artifact types precluded the use of trend surface analysis. The projectile points tend to be concentrated in the center of the excavation area. The preblanks, blanks, preforms, and indeterminate (unclassifiable) bifaces are included on the biface map and are scattered thoughout the excavation block, though they are more numerous in the northwest corner and in the vicinity of the features. Unlike the projectile points and bifaces, the retouched and utilized flakes and cores are located mostly in areas removed from the features. The areas to the east and north of the features contain several pieces of groundstone. Overall, there appears to be slight differences in the horizontal distribution of some of these artifact types.

Figure 75 provides trend surface maps for total debitage and individual maps for the various material types. Debitage was fairly dense throughout the excavation area but was most concentrated along the northern edge, the southeastern corner, and in the vicinity of the features. Except for the density peak in the southeastern corner, debitage density patterns correspond to the pattern for all flaked stone tools. The southeastern corner of the excavation area contains only a few bifaces. The individual trend surface maps of the various material types have the same overall pattern as the one for total debitage except with minor differences. Translucent algalitic is most common in the northern portion and the highest density of opaque algalitic chert occurs in the southeastern corner of the excavation area. Whiskey Buttes chert is mostly limited to the northwestern corner.

The distribution of animal remains is shown in Figure 76. Trend surface maps were made for the number and weight of bone per square meter. On both maps a high density peak occurs in the northeast corner. This area has a paucity of other cultural remains. On the trend surface map for number of bone, another high density area is located in the vicinity of the features. The bones in this area are probably smaller and more fragmentary than those in the northeastern corner. This concentration near the features corresponds to similar patterns for all flaked stone tools and debitage. The majority of the bone in the feature area is large mammal, including pronghorn and deer. A bison bone was recovered from the southeastern corner. A high frequency of unidentifiable large mammal remains occurs in the northeastern corner. The few rabbit bones were found mostly in the northern portion of the excavation area where few of the large mammal remains occur.

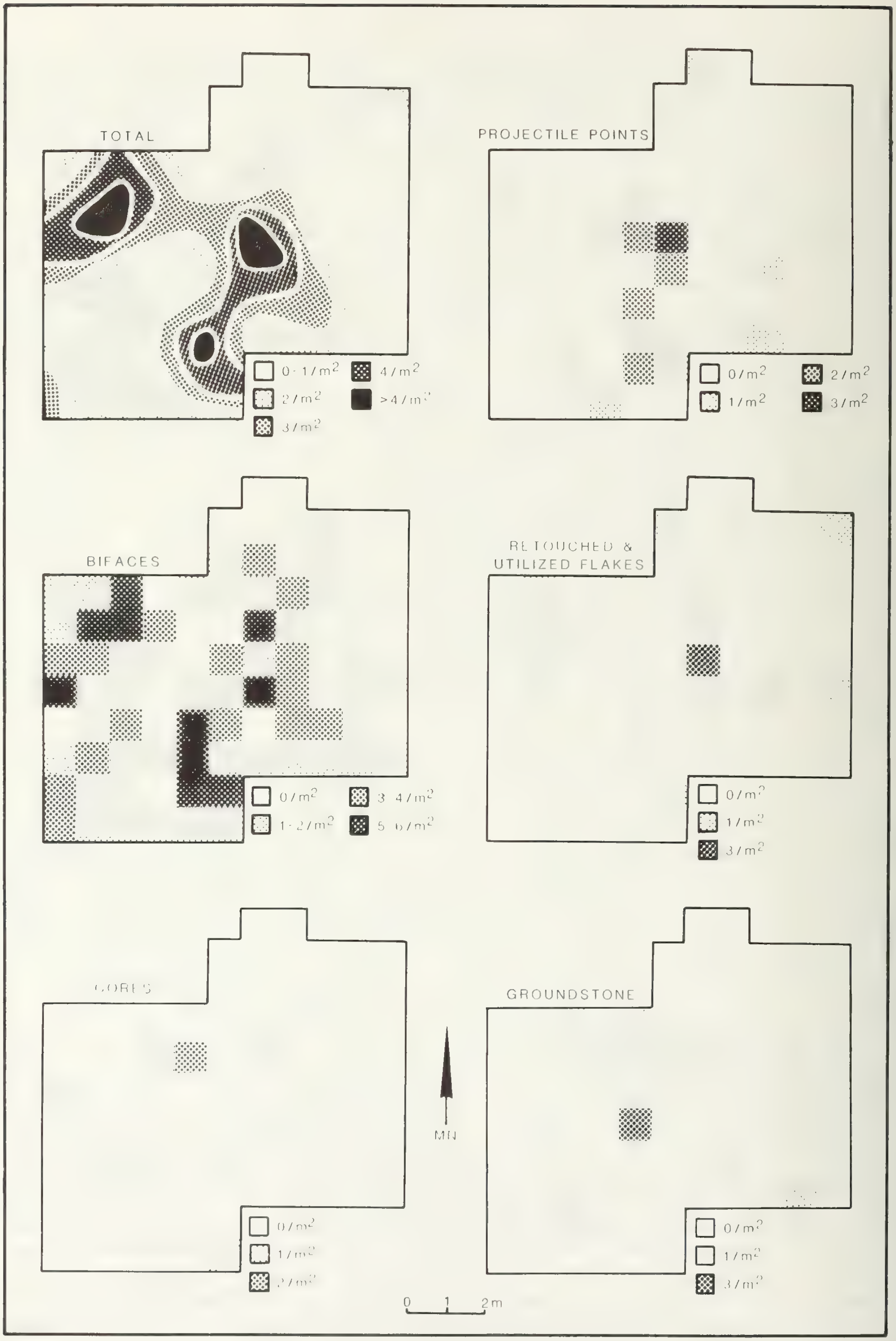


Figure 74. Plan maps of Excavation Area B showing the horizontal distribution of all flaked stone and groundstone tools, Component VII, Taliaferro site.

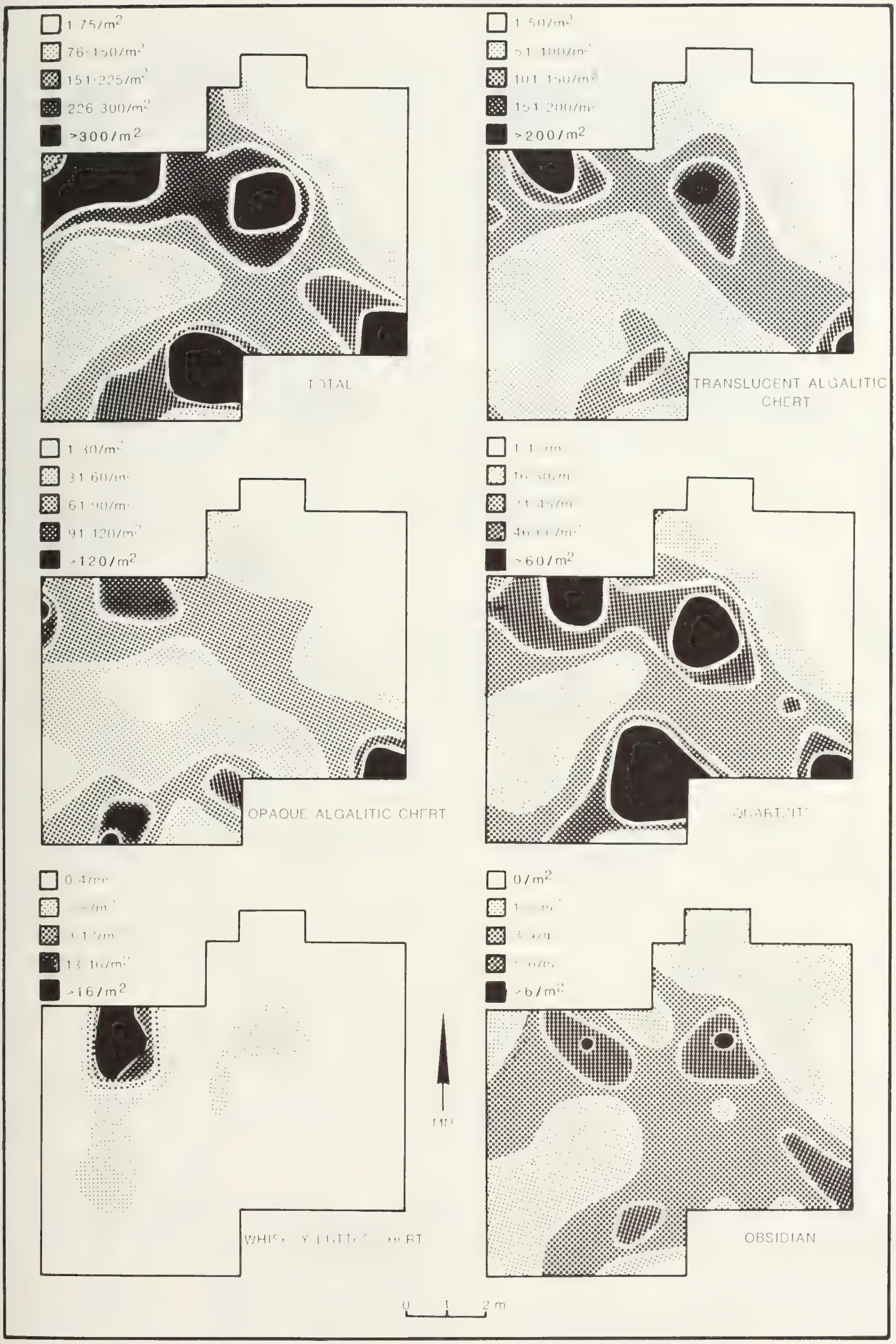


Figure 75. Plan maps of Excavation Area B showing the horizontal distribution of total debitage and material types, Component VII, Taliaferro site.

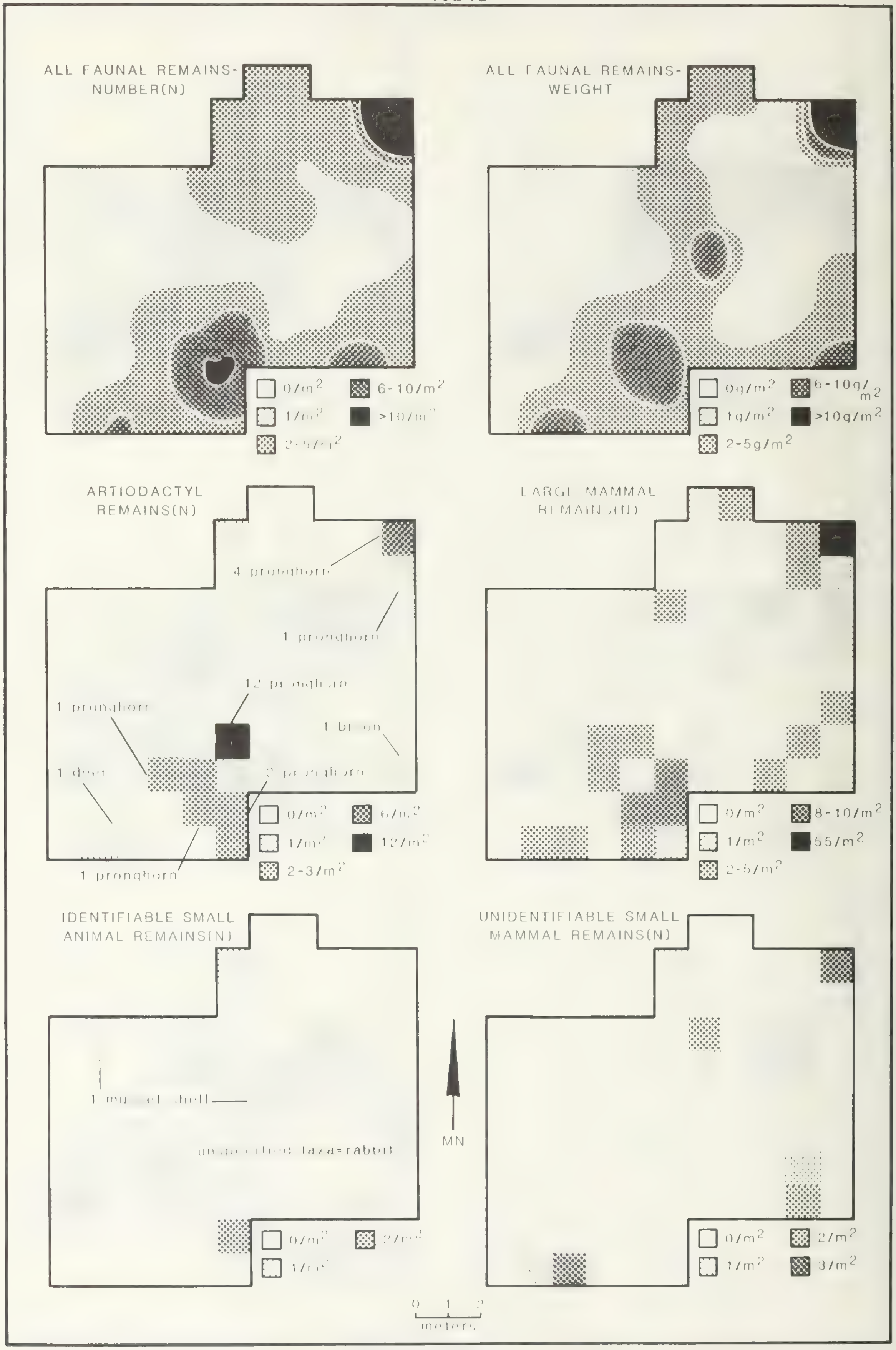


Figure 76. Plan maps of Excavation Area B showing the horizontal distribution of animal remains, Component VII, Taliaferro site.

Generally the flaked stone tools and debitage are most dense in the vicinity of the features and in the northern portion of the excavation area. Their distribution follows that for fire-cracked rock; however, the density peak in the southeastern corner on the debitage trend surface map is in an area with only minor amounts of artifacts and fire-cracked rock. Animal remains are quite common around the features and also are dense in the northeast corner. The northeast corner, however, lacks fire-cracked rock, flaked stone artifacts, and debitage. In general, each of the various (tools, debitage, and bone) remains are more densely concentrated around the features. In other areas various remains cluster singularly, which may represent loci of different prehistoric activities.

Component VIII

Component VIII is the most recent at the site and occurs only as an ephemeral layer in the northeastern portion of the Excavation Area B. It is above the Component VII deposits and just below the present ground surface. Only 10 m^2 of excavated deposits are included in this component. The component lacked pit features, and radiocarbon estimates were not made. Because of the small area included in this component, the spatial relationship of the remains was not examined.

Flaked Stone Artifacts

Only one small, side-notched projectile point and 334 pieces of debitage were recovered from Component VIII deposits. The side-notched point resembles the Desert Side-notched type found throughout the Intermountain West (Holmer and Weder 1980). This point type is usually associated with sites belonging to the Shoshoni occupation. Numerous Desert Side-notched points were recovered from the Eden-Farson site in southwest Wyoming dating to 230 years ago (Frison 1971).

The crosstabulation of debitage type by material type is detailed in Table 32. Translucent algalitic chert is the dominant material type with 64.7% of the total. Opaque algalitic chert occurs in slightly higher percentages (18.0%) than does quartzite (11.7%) debitage. The proportions of debitage material types are similar for most Late Prehistoric components, except Component VI, where almost equal amounts of translucent chert, opaque algalitic chert, and quartzite are present.

The majority of the debitage consists of tertiary flakes accounting for 60.2% of the total. Secondary flakes are represented by 18.6% and primary by 11.1%. As shown in Appendix B, these percentages correspond to the expected ratio of flake types if all stages in the bifacial reduction sequence were performed at the site. This ratio is similar for all components, indicating that cobbles occuring in the vicinity of the site were completely reduced at the locality.

Other Artifacts

Component VIII produced a shell bead and lacked hammerstones and groundstone (Appendix B). The bead is an olive shell (*Clivilla biplicata*) with the spire ground off perpendicular to the long axis. Similar shell beads were recovered from the Wardell (Frison 1973) and Eden-Farson sites (Frison 1971).

Table 32. Crosstabulation of debitage type by material type, Component VIII, Taliaferro site.

Flake Type		Material Type: Trans-lucent Chert	Opaque Chert	Quartzite	Whiskey Buttes Chert	Obsidian	Other	Total
Primary	#	25	5	4	1	2	0	37
	Row %	67.57	13.51	10.81	2.70	5.41	0.00	11.08
	Column %	11.57	8.33	10.26	16.67	18.18	0.00	
	Total %	7.49	1.50	1.20	0.30	0.60	0.00	
Secondary	#	49	9	1	0	3	0	62
	Row %	79.03	14.52	1.61	0.00	4.84	0.00	18.56
	Column %	22.69	15.00	2.56	0.00	27.27	0.00	
	Total %	14.67	2.69	0.30	0.00	0.90	0.00	
Tertiary	#	131	36	23	4	5	2	201
	Row %	65.17	17.91	11.44	1.99	2.49	1.00	60.18
	Column %	60.65	60.00	58.97	66.67	45.45	100.00	
	Total %	39.22	10.78	6.89	1.20	1.50	0.60	
Bifacial Thinning	#	7	1	0	0	1	0	9
	Row %	77.78	11.11	0.00	0.00	11.11	0.00	2.69
	Column %	3.24	1.67	0.00	0.00	9.09	0.00	
	Total %	2.10	0.30	0.00	0.00	0.30	0.00	
Shatter	#	4	9	11	1	0	0	25
	Row %	16.00	36.00	44.00	4.00	0.00	0.00	7.49
	Column %	1.85	15.00	28.21	16.67	0.00	0.00	
	Total %	1.20	2.69	3.29	0.30	0.00	0.00	
Tested Material	#	0	0	0	0	0	0	0
	Row %	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Column %	0.00	0.00	0.00	0.00	0.00	0.00	
	Total %	0.00	0.00	0.00	0.00	0.00	0.00	
Total	#	216	60	39	6	11	2	334
	%	64.67	17.96	11.68	1.80	3.29	0.60	100.00

Animal Remains

Only 18 specimens of bone were recovered from Component VIII (Appendix E). Five of the specimens were identified to prairie dog (Cynomys sp.) which include mandible, ulna, radius, ilium, and tibia fragments. Of the remaining 13, 7 are large mammal, 3 are medium to large mammal, 2 are medium mammal, and 1 is a small mammal bone. They are long bone shafts or bone wall fragments. The meager sample, however, does indicate that both large and small mammals were exploited during this period.

CHAPTER 5

DISCUSSION

ANALYSIS OF SITE ACTIVITIES

As mentioned in Chapter 1, Archaeological Services' major research objective for the Exxon Company, USA, LaBarge Natural Gas Project excavations is the determination of site function through the study of the various prehistoric activities that took place at specific sites. Only with a clear understanding of what types of activities occurred at individual sites can light be shed on problems of a more regional nature. As Binford notes, "to reconstruct the entire pattern of land use, archaeologists have to be able first to identify the specific function of each separate site and then fit all the individual parts together" (1983:131-132). Therefore, the delineation of the kind of activities, the time of year of occupation (seasonality), and the location of the prehistoric activities at the Taliaferro site, as well as at other excavated sites in southwest Wyoming, is the first step toward understanding the lifeways of the prehistoric inhabitants of the area. Eventually the functions of the individual sites will provide background for developing regional settlement and subsistence models.

For this analysis, two approaches were used to delineate the types of activities performed at the site and the function of the site. First, the kinds of cultural debris recovered at the Taliaferro site were considered in relation to the three idealized "activity area" types hypothesized by Creasman et al. (1985) in the project treatment plan. The three activity area types are plant processing, animal processing, and residential. Each type is defined by a specific set of archaeological attributes. The other focus of the site activity analysis is the examination of the spatial relationships of features, fire-cracked rock, flaked stone tools, groundstone, and animal and plant remains. The spatial relationships of these materials provide clues to the patterns of use that took place at the site. Comparisons of these patterns recognized through observation of the relationships between different suites of archaeological materials along with the results from ethnoarchaeological studies of modern hunters and gatherers indicate the possible types of activities conducted at the site. Analogies with modern hunters and gatherers also help refine and revise the hypothesized activity area types.

Comparisons to the Idealized Activity Area Types

Three idealized activity area types are hypothesized by Creasman et al. (1985) in the project treatment plan: these are plant processing, animal processing, and residential. Each type is defined by a specific set of archaeological attributes that can be compared with the data recovered from each excavated site. Ideally, in making the comparisons to these defined attributes, each excavated site can be typed to a particular function. The attributes for each activity area type were derived from the ethnoarchaeological research of Binford (1980, 1983) as well as previous archaeological work in southwest Wyoming. In the following, these attributes are examined in the light of cultural remains found at the Taliaferro site. The validity of the attributes and the activity area types also is evaluated.

According to the model, 14 archaeological attributes are used to distinguish the 3 idealized activity area types. A summary of the attributes for each type is presented in Table 33. Attribute 1 concerns the presence of hearths, which is a requirement for all activity area types. Attribute 2, the presence of anvils, hammerstones, fleshing tools, and/or cleaver/choppers, is a trait only for animal processing areas. Groundstone (Attribute 3) should

Table 33. Summary of hypothetical attributes for the three idealized activity area types from the project treatment plan (Creasman et al. 1985).

	Hypothesized Attribute	Plant Processing	Animal Processing	Residential
1.	Hearths	+	+	+
2.	Anvil, hammerstone, fleshing tool, and/or cleaver/chopper	-	+	-
3.	Groundstone	+	-	+
4.	Positive results from pollen wash of groundstone	+	NA	+ and -
5.	Economic plant remains from features	+	-	+
6.	Economic plant remains from occupation floor	+	-	+
7.	Index of groundstone to flaked lithic tools	greater than 10.0	fewer than 2.0	2.0 - 10.0
8.	Number and type of economic animal species present	2 or fewer small to medium and 1 or fewer large animals	more than 1 large animal	total of 3 or more species
9.	For large animal percentage of bone elements present of total skeleton	less than 20%	greater than 50%	20% - 50%
10.	Bone elements represent butchering units	-	-	+
11.	Bone elements crushed and broken	-	+	-
12.	Flaked debitage constituents:			
	Primary Flakes	less than 5%	less than 5%	2%
	Secondary Flakes	less than 5%	less than 5%	10%
	Tertiary Flakes including micro and submicroflakes	less than 90%	less than 90%	84%
	Other types	less than 5%	less than 5%	4%
13.	Diversity of flaked stone artifact types	low	higher	highest
14.	Patterned distribution of cultural material	+	+	+

Key: + = presence
- = absence
NA = not applicable

occur at plant processing and residential areas. Attribute 4 concerns the results of pollen washes from the groundstone. For the plant processing activity type, groundstone should yield pollen from economic plants with one or two species dominating. Negative and positive results should be obtained from groundstone belonging to residential areas. Attribute 5 deals with the presence or absence of economic plant remains from the fill of features. Features from plant processing and residential areas should have positive results. For Attribute 6, occupation floors of plant processing and residential activity areas should produce either plant macrofossil or microfossil remains of economic plants, and animal processing areas should lack these remains.

The index of groundstone to flaked stone tools (Attribute 7) is computed by the number of groundstone tools divided by the number of flaked stone tools multiplied by 100. This index should be greater than 10 for plant processing types, less than two for animal processing types, and between two and 10 for residential activity types. Attribute 8 concerns the number and type of economic animal species that should occur at each activity area type. For a plant processing areas, two or fewer small to medium animals and one or no large animals should be present. The presence of more than one large animal distinguishes animal processing areas, and residential areas should have three or more species present. The percentage of large animal bone elements of total skeleton for Attribute 9 is calculated by dividing the number of observed bone elements of a species by the total number of bones in the skeleton (roughly 175) and multiplying by 100. For the plant processing area type, the percentage should be less than 20; it should be greater than 50 for animal processing type and between 20 and 50 for residential type. Attribute 10, presence of butchering units, should occur only at residential areas. Crushed and broken bone elements, Attribute 11, is a criterion for the animal processing area type.

The percentages of the various flake types expected for each of the activity types are presented as Attribute 12. For plant and animal processing areas, less than 90% of the debitage should be tertiary flakes and the remaining percentages should be distributed among primary, secondary, and other flake types. The distribution of flake types hypothesized for residential areas is 84% tertiary, 10% secondary, 2% primary, and 4% other. The diversity of flake stone artifacts (Attribute 13) is figured by the number of types observed in a specific sample divided by the total possible number of tool types. In this analysis, 13 was used as the total number of possible artifact types. These are projectile points, drills, notched knives, large preforms, small preforms, blanks, preblanks, distal retouched flakes, lateral retouched flakes, utilized flakes, gravers, modified cobbles or pebbles, and cores. The diversity of flaked stone tools should be lowest for plant processing types and highest for residential types. Finally, Attribute 14 notes that the distribution of cultural remains should be patterned for each of the activity area types. It was envisioned that this attribute would be more fully developed as research progressed. The consideration of spatial relationships of the cultural remains within the site components is part of that process and is taken up in the next section of this report.

The 14 attributes were computed for the data from each of the eight components at the Taliaferro site. The results are detailed in Table 34. A comparison of the results from the Taliaferro site with the hypothesized attributes for the three activity area types indicates that most components, except for Component VIII which lacked a hearth, correspond to the residential type. The classification of most components as residential is consistent with

Table 34. Summary of the Taliaferro site data relevant to the hypothetical, idealized activity area types.

Hypothesized attributes	Components I	II	III	IV	V	VI	VII	VIII
1. Hearths	+	+	+	+	+	+	+	-
2. Anvil, hammerstone, fleshing tool, etc.	+	+	+	+	+	+	+	-
3. Groundstone	+	+	+	+	+	+	+	-
4. Positive results from pollen wash of groundstone	NA	NA	+	NA	+	+	-	NA
5. Economic plant remains from features	+	-	+	+	+	+	+	NA
6. Economic plant remains from occupation floor	NA	NA	NA	NA	NA	+	NA	NA
7. Index of groundstone to flaked stone artifacts	1.5	1.5	5.8	16.0	7.0	6.1	5.9	NA
8. Number and type of animal species present:								
Number of large animals	1*	1*	2	2	3	3	4	1*
Number of small animals	-	1*	1*	9	5	10	4	1
Total Number of species	1	2	3	10	6	10	6	2
9. Percentage of bone elements present of total skeleton:								
Bison	NA	NA	2.3%	1.9%	NA	NA	0.5%	NA
Pronghorn	NA	NA	0.5%	1.7%	1.1%	2.3%	2.9%	NA
Deer	NA	NA	NA	NA	0.5%	0.5%	0.5%	NA
10. Bone elements represent butchering units	NA	NA	+	-	-	-	-	-
11. Bone elements crushed and broken	+	+	+	+	+	+	+	+
12. Flaked debitage constituents:								
Primary flakes	14.5%	14.7%	12.2%	8.7%	8.9%	11.6%	10.3%	11.1%
Secondary flakes	19.0%	25.7%	21.9%	26.7%	21.2%	22.6%	22.4%	18.6%
Tertiary flakes	62.7%	56.5%	57.1%	51.6%	59.4%	55.8%	57.3%	60.2%
Other types	3.8%	3.1%	8.8%	13.0%	10.5%	10.0%	10.0%	10.1%
13. Index of diversity of flaked stone artifact types	.85	.77	.85	.77	.85	1.00	.92	.07

Key: + = presence
- = absence
* = based on specimens identified to large or small animals only
NA = not applicable

general observations of the data. Most components, especially the Late Prehistoric Components IV-VII, have extensive midden deposits with large quantities of flaked stone artifacts, debitage, and other debris, which suggests a long-term occupation. The function of the site during the Early and Middle Archaic Components I and II is less clear. Little evidence of subsistence, such as animal or plant remains, was recovered from these two components. This makes comparisons with the attributes of the idealized activity areas difficult. This problem can be contributed to preservation, especially in Component II, which was subjected to extensive erosional forces.

Though the data from the Taliaferro site compare best with the attributes of the residential type, the fit is not perfect and some attributes match those of the other two activity area types. These results show that several of the hypothetical attributes defined for the idealized activity area types need to be revised and refined using data from recent excavations in southwest Wyoming, a natural consequence of testing and refining any model. A few of the problems with the attributes are discussed below.

One conflict between the results from the Taliaferro site and the hypothesized attributes for the residential type is Attribute 2, which concerns the presence of anvils, hammerstones, fleshing tools, and/or cleavers/choppers. According to Creasman et al. (1985), these implements should occur only at animal processing areas; however, most components at the Taliaferro site produced at least some hammerstones or choppers. One difficulty is determining the exact function of many of the flaked stone artifact types found at the Taliaferro site. Artifacts classified as retouched flakes, modified cobbles, and cores could have served several functions. Additionally, at a residential camp such as the Taliaferro site, several kinds of activities were probably performed, including the use of hammerstones in reduction of stone artifacts (hammerstones), the dressing of hides (retouched flakes), and the breaking of bones for juice and grease (modified cobbles and cores). Attribute 2, however, has merit in terms of defining animal processing sites. Excavations at the Harrowere site, an animal processing site in the LaBarge Project well field, produced results predicted by the attribute. Its classificatory strength does break down when it is applied to residential sites where some initial animal butchering activity took place and, too, where a distiction in tool function (for example, hammerstones used for flaked lithic manufacture and hammerstones used to crack bone) cannot be made. Instead of formulating the attribute as strictly a presence or absence statement, the attribute statement should be formulated as an expression of expected ratio of tool types. For example, in a faunal processing activity area, the ratio of tools used in the butchering of large game (anvils, hammerstones, fleshing tools, and chopper/cleavers) as compared to other tool classes will be high. And, of course, the ratio would be lower for residential sites.

Another problem in applying these idealized attributes, especially when dealing with large, complex components, is that the model was designed to characterize activity areas and not necessarily the component as a whole (see Hoefer 1986; Harrison 1986; Harrell and Mckern 1986; and McKern 1987 for examples of how the models have been applied on a component basis). When applied to components as a whole, the models break down more readily because the data from various activities are lumped together to test the models. Future applications of the models must take this into consideration. Likewise, as the models are revised, attribute statements must be strengthened, additional activity area types defined, and clear statements of how the models are to be applied presented.

The simple notation of the presence or absence of plant macrofossil and microfossil remains can be misleading. The occurrence of high frequencies of pollen from an economic species in a feature could represent quite different activities from the recovery of thousands of charred seeds. These two types of evidence could provide clues to the kinds of plants exploited and season of use, which may indicate different site functions in the settlement system. Though charred plant macrofossils were present in features from most components at the Taliaferro site, the processing of seeds probably was a major activity for only the Late Prehistoric Components IV-VII where thousands of charred seeds were recovered. The features from the Archaic period components yielded only a few seeds.

The index of groundstone to flaked stone artifacts (Attribute 7) for most components is within the range expected for the residential activity type. The Late Prehistoric Component IV has an index of 16.0, which is an attribute for the plant processing activity type, but evidence from most remains for Component IV indicates the same site function and activities as the other Late Prehistoric period components. The Early and Middle Archaic components have an index of 1.5, which corresponds to an animal processing area type. Only a few bone fragments were recovered from these two Archaic components, suggesting that the processing of animals was a minor activity, but the problem with post occupation erosion has been noted.

Some difficulties were experienced in relating the data from the Taliaferro site to the hypothesized attributes concerning animal remains (Attributes 8-11). Problems also arose in determining function of the various components from the analysis. Due to the fragmentary nature of most of the recovered bone, only a small sample was identified to element and species. This created a limited amount of information suitable for comparison. Most components at the Taliaferro site produced the three animal species required for classification as a residential type (Attribute 8), but they also had the more than one large animal needed for the animal processing category. The percentage of total skeleton present (Attribute 9) was computed to be less than 3% for all components because only a few bones of each animal were identifiable, making the attribute meaningless.

Most components lacked butchering units (Attribute 10), a requirement for the residential activity type, again due to the small sample of identifiable bones. Additionally, it was unclear what constitutes a butchering unit, which according to Lyman (1979), depends on butchering techniques. Much of the recovered bone is from the hind quarters and distal extremities of the limbs, perhaps representing butchering units brought to residential areas. According to Creasman et al. (1985), only animal processing areas should produce crushed and broken bone; however, most recovered bone from the Taliaferro site, a residential camp, is fragmentary. It appears that an important activity in residential areas was the crushing of bones for juice and grease.

The percentages of the flake types computed for the Taliaferro site also are different from the predicted values for residential areas. As shown in Appendix B, the percentages of primary, secondary, and tertiary flakes from each component correspond to the expected ratio of flake types if all stages in the bifacial reduction sequence were performed at the site. At a residential camp such as the Taliaferro site where flakeable material occurs as cobbles on the terraces in the area, stone implements were probably entirely manufactured at the camp in preparation for future need. Binford (1979) from studies of the Nunamiut Eskimo, notes that most tools, except for situational gear, are produced and maintained within residential sites. The use of residential areas for this activity may have been a common practice among the prehistoric inhabitants in portions of southwest Wyoming.

Because the flake types are defined by the amount of cortex, the percentages of each type in a collection depends partly on the type of material used. If artifacts are made from large pieces of stone with little cortex that were obtained from a primary source, only a few primary and secondary flakes would be produced. In contrast, tools produced from small tabular cobbles with cortex would result in higher percentages of these flake types though the same activity took place. Another factor is the distance to the raw material source. It has been found that as the distance increases, the amount of cortical debitage decreases (Church, Ruest, and Creasman 1983). Though the actual percentages of the various flake types can not be used to define the idealized activity area types, the reduction stages of flaked stone tool manufacture represented at a site may be an important attribute. Evidence for the reduction stages at a particular site could come from the recovered flake types presented as cumulative percentage curves similar to those discussed in Appendix B.

Except for Component VIII, all components have a fairly high diversity of flaked stone artifacts, a criterion for the residential activity area type. As noted by Thomas (1983), the diversity of a collection is partly the result of sample size. The larger the sample, the more diverse it will be. This probably explains in part the high diversity of the large sample of flaked stone artifacts recovered from most components at the Taliaferro site. What is interesting, however, is that residential areas occupied for long periods of time will probably contain large quantities of flaked stone artifacts. The recovery of numerous artifacts and pieces of debitage from the Taliaferro site further supports the possibility, as observed by Binford (1979) for the Nunamiut Eskimo, that most production and maintenance of tools are associated with these residential camps.

Attempting to group sites into various functional types using a particular set of attributes is a step toward exploring problems of a more regional nature, such as prehistoric settlement and subsistence patterns. Because the set of attributes proposed in the project treatment plan (Creasman et al. 1985) was based on limited data, it is overly simplistic; however, it is a start from which to build. As noted above, problems in the application of the models have arisen. The tendency has been to apply the models to components rather than to discrete activity areas within a given component. This is the fault of the research design where the proper procedures for testing the models and what the models actually model was not explicitly stated. What has transpired has been the forcing of components into the three-part classification. Trying to lump all sites into one of the three groups would tend to obscure any variation in the activities between sites and make developing models of settlement and subsistence systems meaningless. The classification of activity areas and sites into seasonal functional classes is important to future research goals. A reassessment of the research objective is in order.

Binford (1980) views hunters and gatherers as either foragers or collectors, and these subsistence orientations are considered contrasting. Foragers move residential camps to the desired resource and collect foods for immediate use. In contrast, collectors send task forces to specialized sites where foods are collected and processed for larger groups at the base camps and for storage. A functional typology of sites in southwest Wyoming needs to be flexible enough to allow for the consideration of either strategy or a mixture of strategies.

The idealized activity area model assumes that the prehistoric inhabitants of southwest Wyoming were collectors who used task specific localities removed from base camps. In this model, the animal and plant processing activity areas are viewed as the specialized task localities where resources were gathered and processed and then brought back to the residential site. The data from the Taliaferro and other sites (see McKern 1987; Newberry and Hoefer 1987 for examples) indicate that prehistoric hunters and gatherers of the area may have been foragers at least during part of the year and during these times, resource procurement and processing was conducted at residential camps. At the Taliaferro site, a residential camp, the processing of seeds for winter stores was a major activity and probably the dominant activity at the site at least in Late Prehistoric times. The Taliaferro site may be reflective of a model where the base camp was established in the late summer and fall at a locality where seeds could be collected and processed, which made specialized processing sites unnecessary at least for some resources. Though they used a foraging strategy in part, the prehistoric inhabitants also were collectors in that foods were gathered, processed, and stored for consumption during lean winter months.

To obtain a more complete picture of the settlement and subsistence system of the prehistoric hunters and gatherers of the region, more information needs to be accumulated concerning the diversity of activities conducted at individual sites before they are lumped into types. Determining season of occupation, length of stay, kinds of activities, and whether resources were processed for storage or immediate consumption at a site could provide valuable clues for understanding regional problems.

The spatial distribution of the features and other debris reflects the diversity of the activities that took place at the site and how the prehistoric inhabitants used space. In the next section, the relationships of the features, fire-cracked rock, flaked stone tools, debitage, groundstone, and animal and plant remains are discussed for areas belonging to four components at the Taliaferro site. These distributions are considered in light of ethnoarchaeological studies of modern hunters and gatherers and with an eye toward revising research questions and directions.

Spatial Relationships of Cultural Remains

This section is concerned primarily with the study of the use patterns that took place at the Taliaferro site. To understand these use patterns, the spatial relationships of the features and other recovered cultural debris are examined. These relationships and analogies from ethnoarchaeological studies of modern hunters and gatherers suggest the kinds of activities that occurred at the site in the past. As mentioned above, understanding the diversity of the activities at a site will facilitate the determination of the subsistence and settlement strategies of the prehistoric inhabitants.

Ideally, for understanding the prehistoric activities at a site, the tools and debris resulting from a particular activity will be found in association and near the area where the past activity occurred. Several processes, however, act to distort these patterns. As noted by Schiffer (1976) in his discussion on the relationships between cultural behavoir and site formation, both cultural and postdepositional factors need to be considered when addressing past activities. Some tools may be saved and reused several times before they are worn out and discarded (Binford 1979), and they are often removed from use locations (Binford 1977; Yellen 1977). Midden deposits may contain tools from a variety of activities (Clarke and

Korashina 1981). The waste material from the various activities, then, would provide the most information on the past activities though refuse disposal practices may blur these patterns.

From his work with !Kung Bushmen of Africa, Yellen (1977) notes that activities occurring around a central family hearth are not spatially segregated, and debris from several activities are mixed. Observations of the Nunamiut Eskimo at the Mask site led Binford (1978a) to propose a model of drop and toss zones around a hearth. During activities around a hearth, the smaller pieces of debris are dropped near the feature. These small fragments are generally left in place. In contrast, the large pieces are either tossed behind the people at the hearth or dumped out of the way near the use area. Binford (1978a) feels that trash from continued use of the area becomes localized and forms discrete loci.

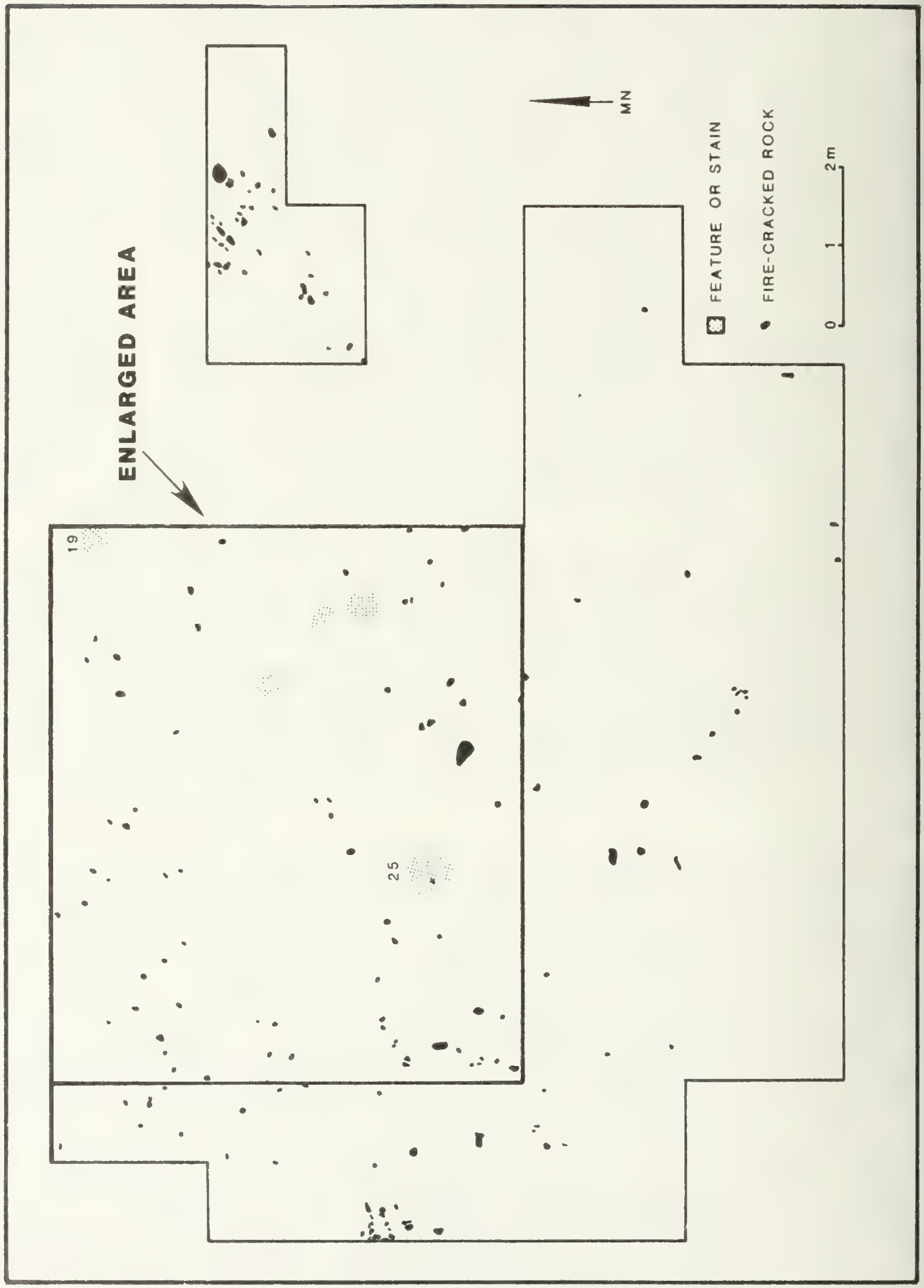
Because the Taliaferro site was an ideal location for an encampment, the locality was reused through the years, and thousands of flaked stone artifacts, pieces of debitage, and other debris from these occupations were left behind. This continued use of the site area with its associated refuse has caused the remains from many activities to become mixed. Several areas, however, display some patterning of the debris, which helps to indicate the types of activities occurring at the site in the past. Though all cultural remains were not sized, the distribution of the fire-cracked rock and other large artifacts provides some information concerning Binford's drop and toss zone model.

In the following, four areas representing different components are examined in detail. They include one each from Components I, III, IV, and VI. These areas are only a portion of the entire area excavated for each component and were selected because they appear to represent the remains of fairly discrete activities. The pattern of the remains occurring in other areas of the excavation blocks was often blurred due to postdepositional erosion or was mixed by the prehistoric inhabitants because of reuse of the site. The following descriptions should give some information concerning past activities and the use of space at a residential site such as Taliaferro.

Component I

The Early Archaic Component I has a radiocarbon age of 5290 years ago and occurs throughout the north half of Excavation Area A. Two partly deflated, small basins (Features 19 and 25) were encountered along with a light scatter of fire-cracked rock. A total of 133 flaked stone artifacts and 11,478 pieces of debitage was recovered; however, the only bone from the component is a wall fragment of a large mammal. Additionally, only a single charred sedge seed was found in Feature 25. Other evidence of the kinds of food consumed at the site during Component I times comes from the presence of pricklypear pollen in the two features. Figure 77 shows the distribution of features and fire-cracked rock for the entire extent of the component. The area examined in more detail during the following discussion is indicated on Figure 77 as well.

An enlargement of the northern portion of Excavation Area A showing the spatial relationships of the features, fire-cracked rock, flaked stone artifacts, and debitage for Component I is illustrated in Figure 78. The two features and fire-cracked rock are shown as recorded, and the flaked stone artifacts are plotted to within a square meter. The debitage concentrations contain at least 200 flakes per square meter, and their distribution was obtained from the trend surface maps in Chapter 4. The wind rose indicates the direction of the prevailing winds, which are usually from the southwest and west (Department of Interior 1978). In considering the resulting patterns


ENLARGED AREA
MN
FEATURE OR STAIN
FIRE-CRACKED ROCK
0
1
2m
19
25

of feature, artifact, and refuse especially in the identification of work areas, wind plays a role (Binford 1983). In Wyoming where wind is a constant, its effect on the placement of refuse and work areas in relationship to hearths and shelters would be strong. We have attempted to take this into consideration in the following discussion. The wind rose is provided to visually portray the current wind patterns.

Two features (Features 19 and 25) occur within the enlarged area shown in Figure 78. Both appear to be partly deflated hearths that were made in small prepared basins. Because the features were over 5 m apart, they probably represent loci of separate family units. In his examination of the spatial relationships of the remains from a hunter-gatherer camp at Ngarulurutia, Australia, Hayden (1979) notes that the sleeping and eating hearths of separate family units were about 5 m apart. The closely spaced camps studied by Hayden (1979) were occupied by closely related social groups, which may be the case at the Taliaferro site. The features at the Taliaferro site also were fairly free of debris from special processing activities, indicating that they functioned as eating and sleeping hearths. Hayden (1979) and Binford (1983) have observed that sleeping areas and hearths were not used exclusively for sleeping, but meals were prepared and consumed in the vicinity.

As shown in Figure 78, the relationships of the fire-cracked rock, flaked stone artifacts, and debitage around each hearth are similar. These distributions support the conclusion that the remains are from two separate family units. Normally the same kinds of activities take place at each family unit hearth, which would create similar distribution of debris. Yellen (1977), from his work with the !Kung Bushmen, notes that similar activities occurred around each family unit hearth in an encampment. Each of these family unit areas formed a cell within the overall community pattern of the site. The pattern of activities and resulting debris around a hearth were repeated for each family unit or social group occupying the encampment.

Each of the two camps at the Taliaferro site had a hearth surrounded by an area fairly free of debris except for a few associated stone artifacts. To the west and southwest of the hearths were scatters of fire-cracked rock with additional flaked stone artifacts. Farther removed were dense concentrations of flaking debitage and artifacts. Because only a small portion of the Early Archaic period deposits were excavated, some of the debris, such as the debitage concentrations, may be associated with hearths outside the excavation area; however, the patterns recognized from the exposed areas should be similar for the rest of the site.

Apparently the areas immediately around the hearth were used for sleeping as shown by Hayden's (1979) ethnoarchaeological studies in Australia. Some food, most likely, was prepared and consumed near the hearths as well. Pricklypear fruits or stems were at least part of the food eaten; evidence for the use of other types of food is lacking. Ethnographically, pricklypear was an important food plant for the Indian groups throughout the Intermountain West (Yanovsky 1936). The Indians of the Plains ate the young joints and red fruit (Blankinship 1905). The joints usually were boiled, which allowed for the easy removal of the skin and spines. Some Indian groups roasted the stems in hot ashes to remove the thorns (Chamberlin 1911; Palmer 1871). Because pricklypear pollen was found in the fill of both features, the stems and fruit probably were roasted in a similar manner at the Taliaferro site during Component I times. Pricklypear fruits are ripe in the late summer, indicating an occupation at that time of year. Some of the bifaces and retouched flakes recovered in the vicinity of the hearths may have facilitated the pricklypear processing.

... portion of Excavation Area A showing spatial relationship of features, fire-cracked rock, flaked

Fire-cracked rock and some flaked stone artifacts were scattered in the upwind area to the west and southwest of the features. Most of this material was at least a meter from the hearths. Most likely the large pieces of fire-cracked rock and flaked stone artifacts represent what Binford (1978a, 1983) refers to as a "toss zone." Debris resulting from activities conducted in the smoke-free area upwind from the hearth were tossed away from the sleeping area. Activities associated with a hearth most often occur in smoke-free areas, and unwanted, large pieces of debris are thrown over the shoulder of the people seated at the hearth (Binford 1983).

The dense concentrations of debitage and flaked stone artifacts may represent men's eating and work areas as described by Binford (1983) for the Nunamiut Eskimo. In these areas, away from the cooking and sleeping area, the men may have sat and produced flaked stone implements for further use. As noted by Binford (1979), most tools are produced, maintained, and discarded within residential sites. The ephemeral charcoal stains present within the eastern debitage concentration may be deflated hearths used by the men while producing flaked stone tools.

The family unit areas at the Taliaferro site probably were occupied for a short time. Though large quantities of flaked stone artifacts and debitage were recovered, concentrations of fire-cracked rocks or trash middens indicating a long period of occupation were absent. Large amounts of debitage could be produced in a fairly short time. The absence of bone and other subsistence information indicates that some meals were consumed away from the hearth areas. Additional family unit areas and special processing areas may be present in the unexcavated portions of the site.

Each camp at the Taliaferro site, consisting of a hearth, a toss zone with fire-cracked rock, and a debitage and artifact concentration, incorporated about 20 m^2 of excavated area. Both camps probably were larger, but portions of each were unexcavated. The camps and associated trash observed by Hayden (1979) at Ngarulurutia, Australia, covered about 36 m^2. However, these camps were occupied by only two people and lacked men's working areas removed from the sleeping and cooking hearths. Binford's (1978a) model of the drop and toss zones around a hearth includes about 25 m^2. The camps at the Taliaferro site appear slightly smaller than ones recorded in the ethnoarchaeological literature.

In summary, the spatial analysis of the remains from a portion of the exposed Component I deposits indicates that at least two closely related groups or family units camped at the site for a short period of time. Most likely pricklypear stems or fruit were prepared and consumed, which suggests a late summer occupation. Some activities, such as sleeping and cooking, occurred in the vicinity of the hearths, and the men produced and maintained stone tools in special areas removed from the hearths.

Component III

The Late Archaic Component III has radiocarbon ages of 2850, 2590, and 1910 years ago and occurs mostly in the south half of Excavation Area A. Six features, including rock-filled basins, irregular-shaped pits, and a medium basin, were encountered as was fire-cracked rock. A total of 120 flaked stone tools and 7881 pieces of debitage was recovered. Most of the 84 specimens of bone and teeth from Component III are from large mammals and artiodactyls. Identified species are bison and pronghorn. Additionally, 34 charred seeds of primarily goosefoot were recovered from the fill of three of the six features. The analysis of pollen from the feature fill supports the interpretation that goosefoot seeds were processed in the vicinity of the features. Figure 79

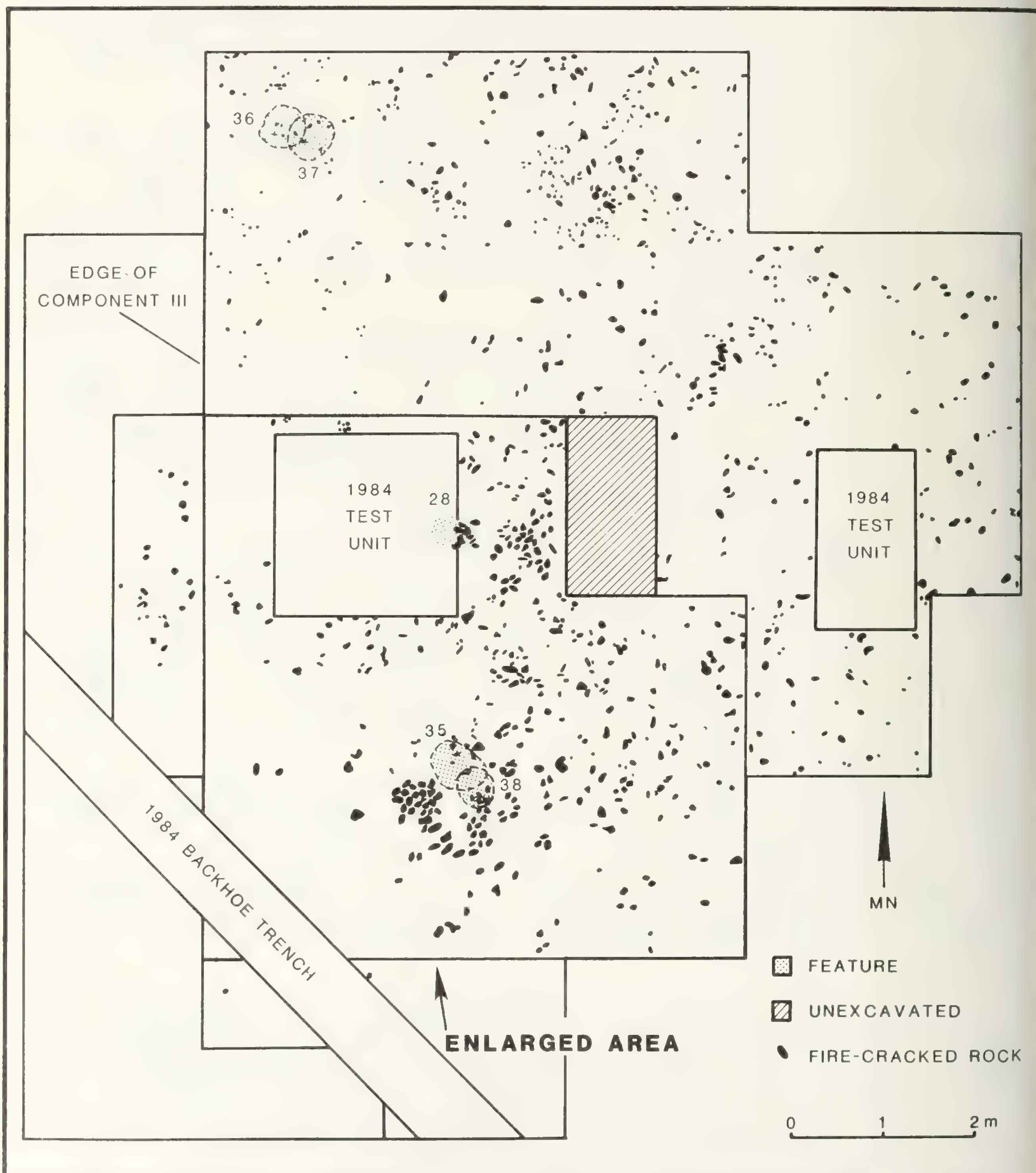


Figure 79. Plan map of the south half of Excavation Area A showing distribution of features and fire-cracked rock, Component III, Taliaferro site. The location of the area enlarged on the next figure also is shown.

shows the distribution of the features and fire-cracked rock for Component III in the south half of Excavation Area A. The area to be examined in more detail during the following discussion is also indicated on Figure 79.

An enlargement of a portion of the south half of Excavation Area A for Component III, showing the spatial relationships of features, fire-cracked rock, flaked stone tools, debitage, and animal remains, is illustrated in Figure 80. For this figure, the features and fire-cracked rock are shown as recorded, and the flake stone artifacts are plotted to within a square meter. The debitage concentrations roughly correspond to areas with at least 55 flakes per square meter, and their distribution comes from the trend surface maps in Chapter 4. The locations of the bone concentrations were obtained from the maps in Chapter 4 as well.

The area enlarged in Figure 80 includes three of the six features belonging to Component III. Two of the features, Features 35 and 38, were part of what is referred to as a double feature. This double feature consisted of an irregular-shaped pit (Feature 35) that was just above and to the side of a rock-filled basin (Feature 38). The remaining feature, Feature 28, was a rock-filled basin lacking an associated irregular-shaped pit. The double feature and the rock-filled basin were approximately 2 m apart.

As indicated by the distribution of the fire-cracked rock, debitage, and animal remains around the two distinct hearth areas, similar activites occurred at both. Most likely the two loci represent different occupations at the site. The locus containing the double feature was radiocarbon dated at 2850 years ago and the rock-filled basin (Feature 28) at 2590 years ago. Additionally, the features were closer than would be expected if the activities were performed during the same occupation. Both occupations, however, belong to the Late Archaic period and probably are separated only slightly in time. In the archaeological record, the two occupations appear as a single layer.

The features probably served as firepits for heating rocks for use in boiling water. According to Wyeth, stones were heated in a fire and then added to the contents of the basket "producing a mess mixed with soot, ashes, and dirt" (1851:211). Small animals, such as rabbits, and ground seeds were cooked in baskets with red hot rocks (Kelley 1932; Lowie 1924; Steward 1933). Bone grease or juice also was produced in water heated with rocks in baskets (Binford 1978b; Vehik 1977). The features could have functioned as ovens for roasting animals or plants, but the kind of debris recovered and their spatial distribution indicates that the primary purpose of the features was to heat rocks.

Both activity loci had, in addition to firepits, a concentration and scatter of fire-cracked rock, a concentration of debitage, and a concentration of bone from large mammals and artiodactyls. Apparently a major activity associated with the two areas was the production of bone grease or juice. Bones from the hind quarters and distal extremities of the limbs of mostly bison and pronghorn were broken up and boiled in baskets with hot rocks. The process probably followed that described by Binford (1978b) for the Nunamiut Eskimo and Vehik (1977) for the Plains Indians. After the bone juice or grease was made, the rejected bone fragments were dumped in areas removed from the features, out of the way of the workers. The bone fragment dump for the double feature (Features 35 and 38) area was about 2 m to the north, and the dump associated with Feature 28 was downslope and about a meter to the southwest of the feature. Similar patterns of discarding unwanted bone fragments were recorded for the Nunamiut Eskimo (Binford 1983).

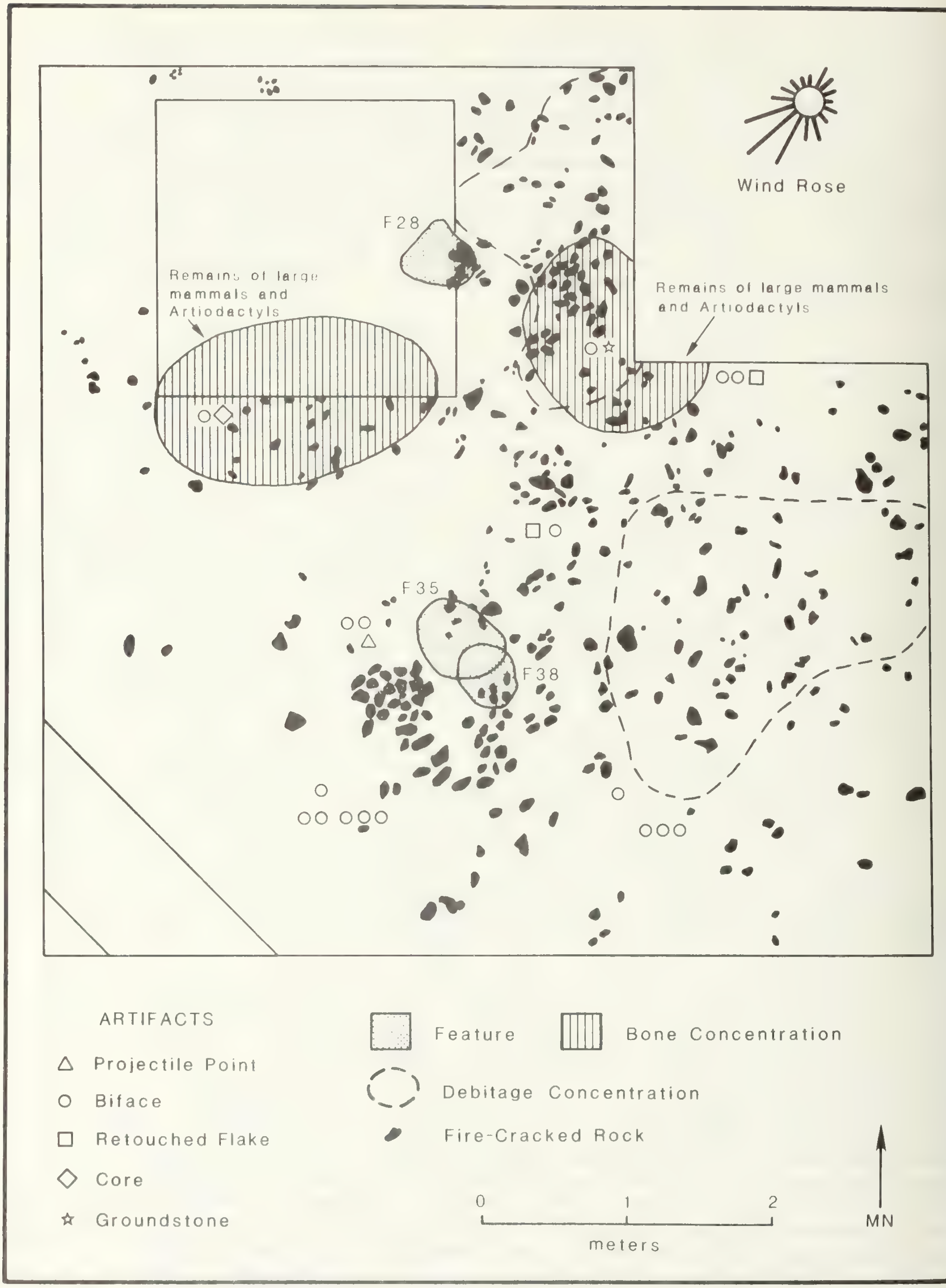


Figure 80. Plan map of a portion of the south half of Excavation Area A showing spatial relationship of features, fire-cracked rock, flaked stone artifacts, bone, and debitage concentrations, Component III, Taliaferro site.

Binford (1978b) mentions that when bones are boiled in containers with hot rocks, large quantities of fire-cracked rock are rejected, and this accumulates in the area. The concentrations and scatters of fire-cracked rocks in the vicinity of the two feature loci probably were the result of this activity. Some of the rocks appear to have been dumped next to the feature, and others were thrown and scattered downslope, out of the way of the workers. For the double feature locality, the rocks were piled in an area separate from the bone fragments; but for the other activity area, the rocks and bone were dumped together downslope from the feature.

The area just northwest of the double feature (Features 35 and 38) was free of large debris and was surrounded by a scatter of fire-cracked rock. Most likely the individuals performing the activities at the firepits were seated in this debris-free area. The seated individuals would have worked upwind from the firepit, opposite the side of the most dense smoke as noted by Binford (1983) from his ethnoarchaeological studies. Though the wind is usually from the southwest and west in southwest Wyoming, the wind during this occupation may have come from the northwest. During the occupation associated with Feature 28, the wind may have blown from the west--its normal direction. The trash in the vicinity of Feature 28 was concentrated on the east side, indicating the workers used the smoke-free area on the west side. Unfortunately, the material on the west side of the feature was excavated during the 1984 testing, and the locations of the fire-cracked rock and other debris were not recorded.

The debris-free area near Features 35 and 38, which was surrounded by large pieces of fire-cracked rock, may represent what Binford (1978a, 1983) refers to as drop and toss zones. The clear area appears to be the drop zone, and the toss zone is represented by the area containing the scatter of fire-cracked rock.

Because only 84 pieces of bone were associated with Component III, the production of bone juice at the site was probably for immediate consumption, and the site was not a specialized bone processing area. The two loci may represent general kitchen areas of a residential camp where the boiling of a few pieces of bone for juice or grease was just one of many activities. The recovery of a mustard family and a goosefoot seed from Feature 28, as well as goosefoot seeds from features in other portions of the excavation area, indicates that food plants also were processed at the site during Component III times. Pollen of the Liliaceae family found on a metate suggests that roots or bulbs of a lily were ground at the site. The concentrations of debitage located downslope from the features provide evidence that flaked stone artifacts were manufactured as well. As would be expected at a residential camp, all steps in the reduction sequence of flaked stone implements were performed at the site. Other areas of the site removed from the messy cooking and manufacturing locality may have been used for such activities as sleeping or storage.

According to Vehik (1977), the processing of bone for juice or grease could occur at any time of the year and at several different site types depending on the settlement system. Binford (1978b) notes that the Nunamiut Eskimo intensively made bone grease at the end of the winter, just before moving from the winter camp. Throughout the summer, the Eskimo also produced small quantities of juice for immediate consumption. Therefore, bone grease or juice production at the Taliaferro site could have taken place at any time of the year. The few goosefoot and mustard seeds found in some features indicate a late summer and fall occupation for the site. The grinding of lily bulbs would have occurred during the summer. Most likely the site was inhabited in the summer during the Late Archaic period.

The activity area with associated debris around the double feature (Features 35 and 38) incorporated about 25 m^2. From Binford's (1983) observations at Anaktuvuk Pass, Alaska, debris resulting from activities around a hearth that included boiling bone for juice also covered about 25 m^2. The activity locus recorded by Binford at Anaktuvuk Pass was just one of many at the site, and additional activities were conducted in other areas. For the Taliaferro site, the features and associated material for the two loci discussed in this section probably represent only a portion of the many activities that occurred at the residential camp during Component III times.

In summary, the spatial analysis of the remains from the two activity loci belonging to the Late Archaic Component III indicates that bone was boiled for juice or grease and the resulting bone fragments and fire-cracked rock were dumped or thrown out of the way. Other activities included the manufacturing of flaked stone artifacts and the processing of seeds and possibly roots or bulbs. These two loci represent only a portion of the past activities that may have occurred at the residential camp. The site was probably occupied during the summer.

Component IV

The Late Prehistoric Component IV has a radiocarbon age of 1500 years ago and occurs in the eastern half of Excavation Area B. Nine features, including large, medium, small, and oxidized basins and an irregular-shaped pit, belong to the component. Seven of the features formed two groups of associated features referred to as multiple feature groups. A total of 75 flaked stone artifacts and 3363 pieces of debitage was recovered. The 197 specimens of bone, teeth, and shell are distributed among large and small animals, including bison, pronghorn, jackrabbit, cottontail, muskrat, ground squirrel, vole, sage grouse, and sucker. The nine features yielded 1910 charred seeds representing 14 taxa with goosefoot dominating the collection. The pollen record from the features and occupation floor also indicates the use of goosefoot. Figure 81 shows the distribution of features and fire-cracked rock for the entire component. The area to be examined in more detail during the following discussion is indicated on Figure 81 as well.

An enlargement of the northern portion of Excavation Area B for Component IV showing the distribution of fire-cracked rock, flaked stone artifacts, debitage, and animal remains around one of the multiple feature groups is illustrated in Figure 82. For Figure 82, the features and fire-cracked rock are shown, and the flaked stone artifacts are plotted to within a square meter. The debitage concentration roughly corresponds to areas with at least 170 flakes per square meter, and their distribution comes from the trend surface maps in Chapter 4. The locations of the bone concentrations were obtained from the maps in Chapter 4 as well.

The area enlarged in Figure 82 includes the four features (Features 15, 16, 17, and 18) that were part of a multiple feature group and a medium basin (Figure 26). The multiple feature group consisted of a large, medium, small, and oxidized basin. This group and Feature 26 probably represent and area where several serial or simultaneous tasks occurred. Because of the large number of and wide variation in charred plant macrofossils recovered from these features, they probably were used in seed processing activities. Other activities that may have taken place in the vicinity of the features include the roasting of small mammals, such as rabbits and muskrats, the production of bone grease or juice from the remains of large and small mammals, and the

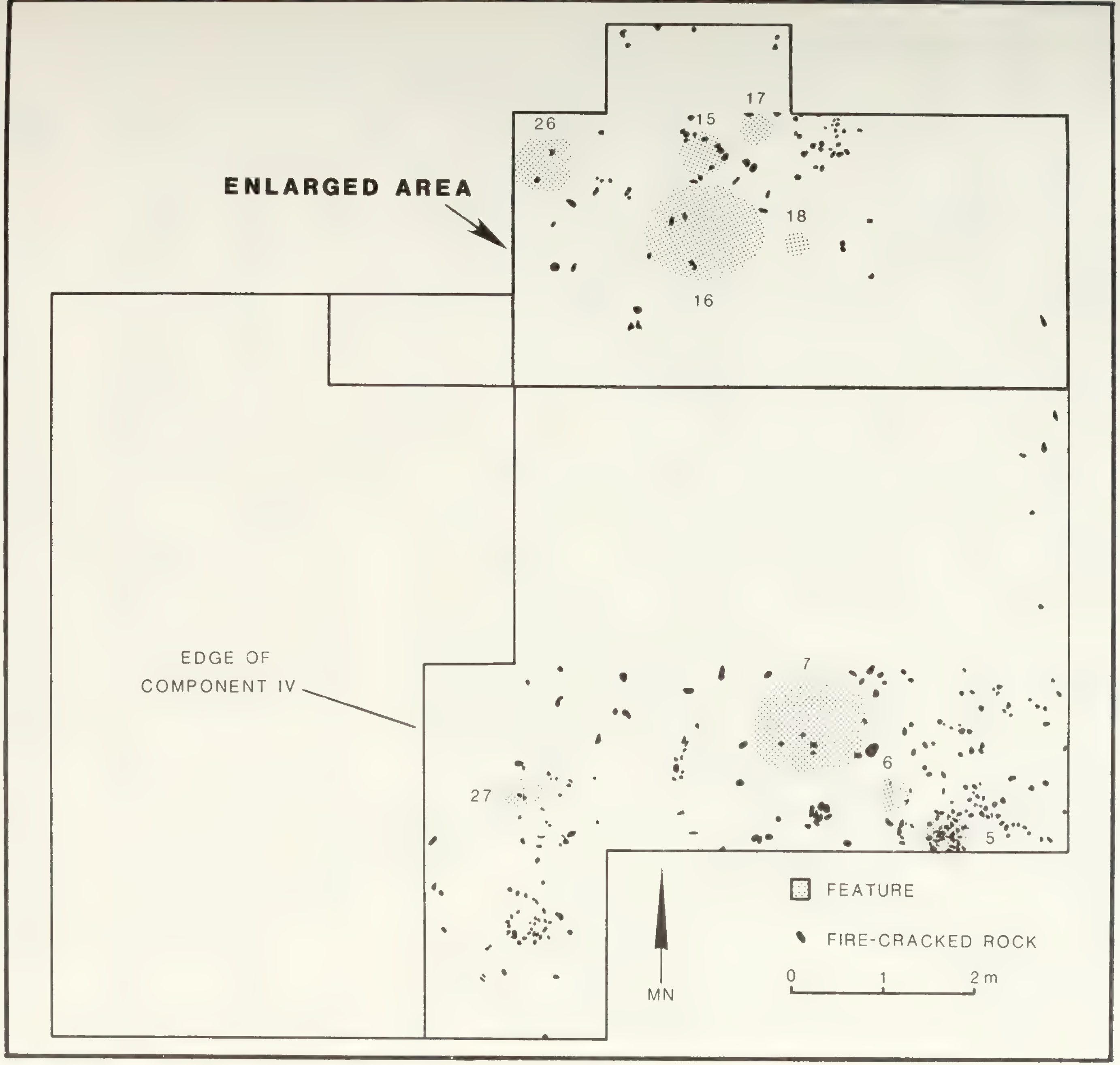


Figure 81. Plan map of Excavation Area B showing distribution of features and fire-cracked rock, Component IV, Taliaferro site. The location of the area enlarged on the next figure also is shown.

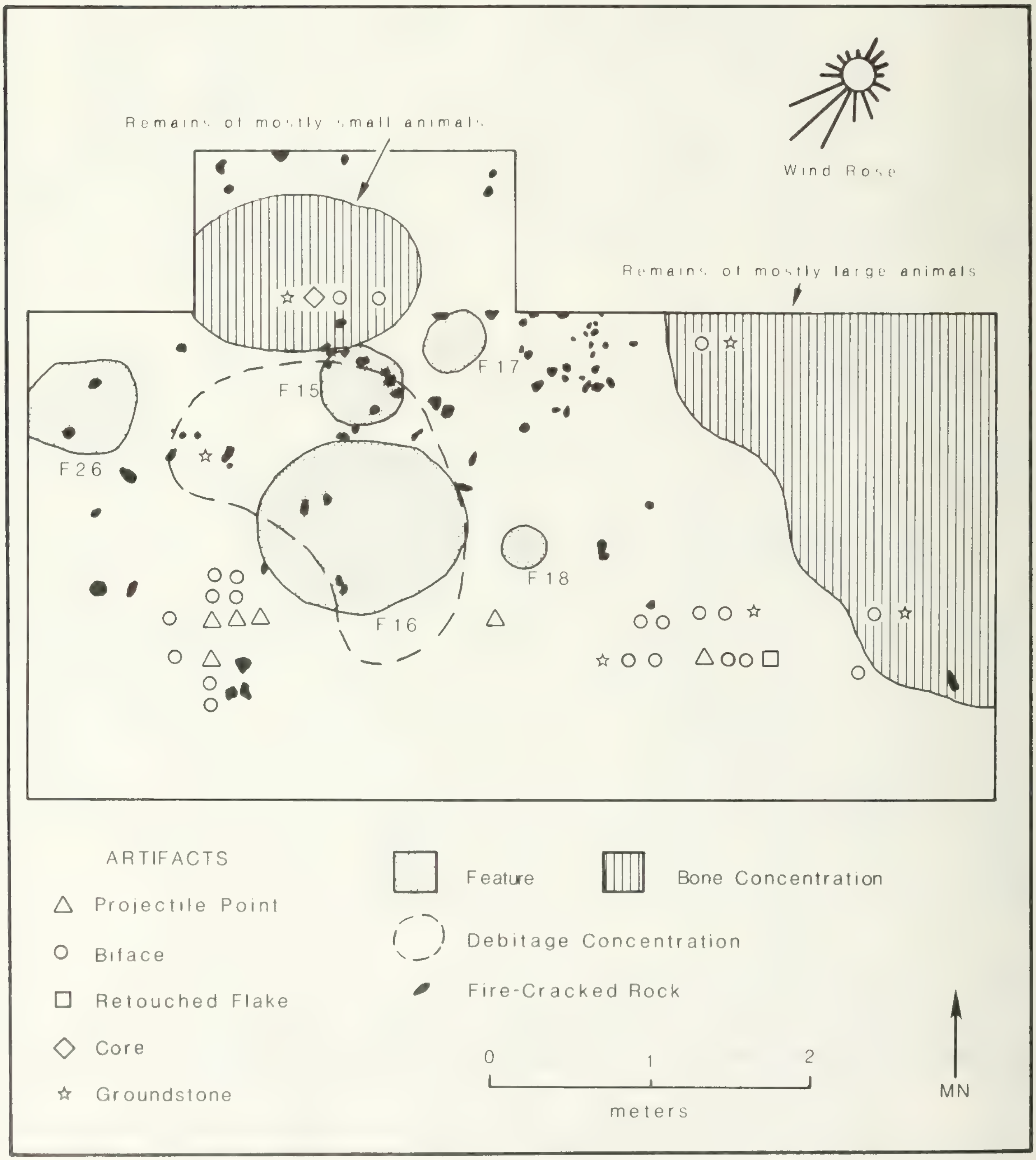


Figure 82. Plan map of the northern portion of Excavation Area B showing spatial relationships of features, fire-cracked rock, flaked stone artifacts, debitage, and bone concentrations, Component IV, Taliaferro site.

manufacture of flake stone implements. Similar activities probably occurred around the other multiple feature group located in the southern portion of the excavation area.

According to ethnographic descriptions of seed gathering and processing techniques, the women brought the gathered seeds to the encampment for threshing and winnowing. The threshing was accomplished by placing the seeds on the ground and beating them with sticks or paddles. The threshed material was thrown into the air, allowing the wind to blow away the lighter unwanted parts while the seeds fell onto a skin. Next, the seeds often were parched with hot coals in basket trays and ground on a metate (Chamberlin 1911). A more detailed description of the seed processing techniques is provided in Appendix C.

These processing activities probably were centered just upwind and to the west of the oxidized basin (Feature 15) and the large basin (Feature 16). The area to the west of these features is fairly free of fire-cracked rock and probably represents a drop zone as described by Binford (1983). In this area, women gathered to thresh and winnow the seeds. Most likely seeds were parched in basket trays with coals obtained from a firepit such as the oxidized basin. The rejected coals were dumped in the large basin next to where the women were seated. The large basin was part of the toss zone as was the area to the east of the multiple feature group where a scatter of fire-cracked rock occurred.

Though most of the seeds may have been processed for winter stores, some may have been ground into flour for immediate consumption. The Indians of the Intermountain West usually prepared the ground flour as mush or bread (Chamberlin 1911; Palmer 1871, 1878). To make the mush, the seed meal was mixed with water and boiled in a basket with hot rocks. The fire-cracked rock present to the east of the multiple feature group may represent the toss zone (Binford 1983) from such an activity. During ethnographic times, a dough made from ground seeds was baked in hot ashes to produce a bread. According to Simpson (1876:54), these cakes looked "precisely like a cake of cattle-ordure." At the Taliaferro site, the oxidized basin (Feature 15), which contains the largest quantity of charred seeds for the component, may have functioned as an oven for seed cakes.

Another past activity evident from the remains in this area was the roasting of small mammals. These animals included rabbit, muskrat, ground squirrel, and vole. During ethnographic times, rabbits and other small mammals were cooked in oven pits (Kelly 1932; Lowie 1924). In 1859, J. H. Simpson observed Digger Indians of the Great Basin cooking small rodents and mentions that the Indians "after throwing the rats in the fire, and thus roasting them, eat them, entails and all, the children in particular being very fond of the juices, which they would lick in with their tongues and push into their mouths with their fingers" (Simpson 1876:71-72). In another place in his journal, Simpson mentions that small mammals were boiled in a pot or basket. He provides the following description of this activity:

> While this was going on, an Indian came in from his day's hunt. His largest game was the rat, of which he had a number stuck around under the string of his waist. These were soon put by the old women on the fire, and their hair scorched; this done, she rubbed off the crisped hair with a pine-knot, and then, thrusting her finger into the paunch of the animal, pulled out the entrails. From these, pressing out the offal, she threw the animal, entrails and all, into the pot [Simpson 1876:53].

The concentration of small animal remains located just north of the multiple feature group probably resulted from dumping the unwanted bone from these roasting activities. The small animals may have been roasted in the medium basins (Features 17 and 26) or in the oxidized basin (Feature 15). Hot rocks obtained from these features could have heated the water for boiling the smaller animals in baskets.

The recovery of bone from large mammals such as bison and pronghorn indicates that portions of these animals were brought to the encampment for cooking and processing. In addition to meat, the bone was crushed and boiled for juice or grease following the process as described by Binford (1978) and Vehik (1977). Evidence for bone grease processing comes from the fragmentary nature of the recovered specimens. Apparently, most of the bone fragments were dumped downslope and to the east of the features. This processing was a minor activity to produce grease or juice for immediate consumption.

The manufacture of flaked stone implements was another endeavor conducted in the vicinity of the multiple feature group. Interestingly, the debitage was concentrated around the large basin and oxidized basin, and most of the bifaces and projectile points occurred to the southwest and southeast of the features. Tool production may have taken place near the features and the rejected bifaces tossed out of the way; or, the concentrations of tools may represent loci of separate activities not associated with the features. In either case, the entire sequence of stone tool manufacture is represented by the artifacts and debris recovered from Component IV. As noted by Binford (1979), most tools are produced, maintained, and discarded within residential camps.

The activity locus from Component IV covered about 25 m^2; however, much of it and the associated debris are unexcavated. The entire activity area may have incorporated up to 40 m^2. Most likely this area was just one of many present at the residential camp. Similar activities probably took place in the vicinity of the other multiple feature group belonging to this component. Sleeping areas and localities containing debris from other activities probably occur in nearby unexcavated areas. The residential camp was occupied in the late summer and fall as indicated by the recovery of seeds that would have been available during this season.

In summary, the spatial analysis of the remains from the activity locus belonging to the Late Prehistoric Component IV indicates that seeds were intensively processed and the debris left in the work area. Small animals also were roasted or boiled and their bones dumped nearby. Portions of larger mammals were carried to the site, and in addition to the meat, the bones were crushed and boiled for grease or juice. These remains generally were put in areas downslope and to the east of the features. All stages of flaked stone tool manufacture were performed in the area. The area examined for this discussion probably represents just one of many loci of activities present at the residential camp during Component IV times.

Component VI

The Late Prehistoric Component VI has a radiocarbon age of 1170 years ago and occurs throughout the south half of Excavation Area A and along the western and southern edges of the north half of the excavation area. Four pit features, including the possible structure (Feature 30), a large basin, and small basins, were excavated along with a scatter of fire-cracked rock. A total of 228 flaked stone artifacts and 9485 pieces of debitage was recovered. The 290 specimens of bone, teeth, and shell were identified to ten taxa representing large and small mammals, bird, fish, and mussel. Three of the four features yielded 2396 charred seeds with most occurring in Feature 30. The pollen record from Feature 30 and the occupation floor outside also indicates the use of goosefoot. Because cultural material belonging to Component VI occurred in a 60 cm thick deposit that encompassed the entire Late Prehistoric period, only the remains within occupation layer VIb associated with Feature 30 were used in the spatial distributions discussed below.

Figure 83 shows the distribution of Features 29, 30, and 33 and associated fire-cracked rock. The area to be examined in the following discussion is indicated on Figure 83 as well. The enlargement of a portion of the south half of Excavation Area A showing the distribution of fire-cracked rock, flaked stone artifacts, debitage, and animal remains around Feature 30 is illustrated in Figure 84. For Figure 84, the features and fire-cracked rock are shown as recorded, and the flaked stone artifacts are plotted to within a square meter. The debitage concentration roughly corresponds to areas with at least 70 flakes per square meter and their distribution comes from the trend surface maps in Chapter 4. The locations of the bone concentrations were obtained from the maps in Chapter 4 as well.

The area enlarged in Figure 84 centers around Feature 30 and associated debris. Feature 30 was a large basin, measuring about 2 m in diameter, that contained a stratified fill with large amounts of charcoal and debris. Most likely, this basin originally was covered by a temporary structure or wickiup and represents a structure or living area. High frequencies of sagebrush pollen from occupation floor samples located on the southern, western, and southeastern sides of the feature indicate that the superstructure was made of sagebrush. The sagebrush was piled on the side of the prevailing wind (thus providing a wind-free area within the feature) as well as around its northern and western sides. As noted in Chapter 4, sagebrush structures were common among the historic Indian groups of the Intermountain West (Irving 1854; Simpson 1876).

During ethnographic and historic times, these sheltered areas were the loci of several types of activities. In 1859, Simpson observed one of the sagebrush shelters in the Great Basin and mentions that "In this enclosure were a number of men, women, and children . . . An old women supertended the cooking, and at the same time was engaged in dressing an antelope-skin" (1876:51-52). The actual depression of Feature 30 may have formed unintentionally in the sand during many intensive activities within the sheltered area. Powell in the late 1860s records that after clearing a circular space of ground, the Kaibab Paiute would "wallow in it during the day, and huddle together in a heap at night, men, women, and children; buckskins, rags, and sand" (1875:126).

The sheltered area represented by Feature 30 at the Taliaferro site may have served similar functions as those mentioned in the ethnographic literature. The feature, however, may have had a more specalized purpose. The processing of seeds for winter stores was a major endeavor at the site as evidenced by the thousands of charred plant macrofossils recovered from Feature 30. As described in the activity discussion for Component IV, the women brought the gathered seeds to the encampment for threshing, winnowing, and charring (Chamberlin 1911). These processing activities probably took place in the wind-free area of Feature 30. Much of the refuse from the charring appears to have collected or perhaps been dumped in the feature area. The 62 pieces of bone, including sucker, ground squirrel, and rabbit, recovered from the feature suggests that animals were cooked in the area as well. The recovery of a projectile point, bifaces, 3245 pieces of debitage,

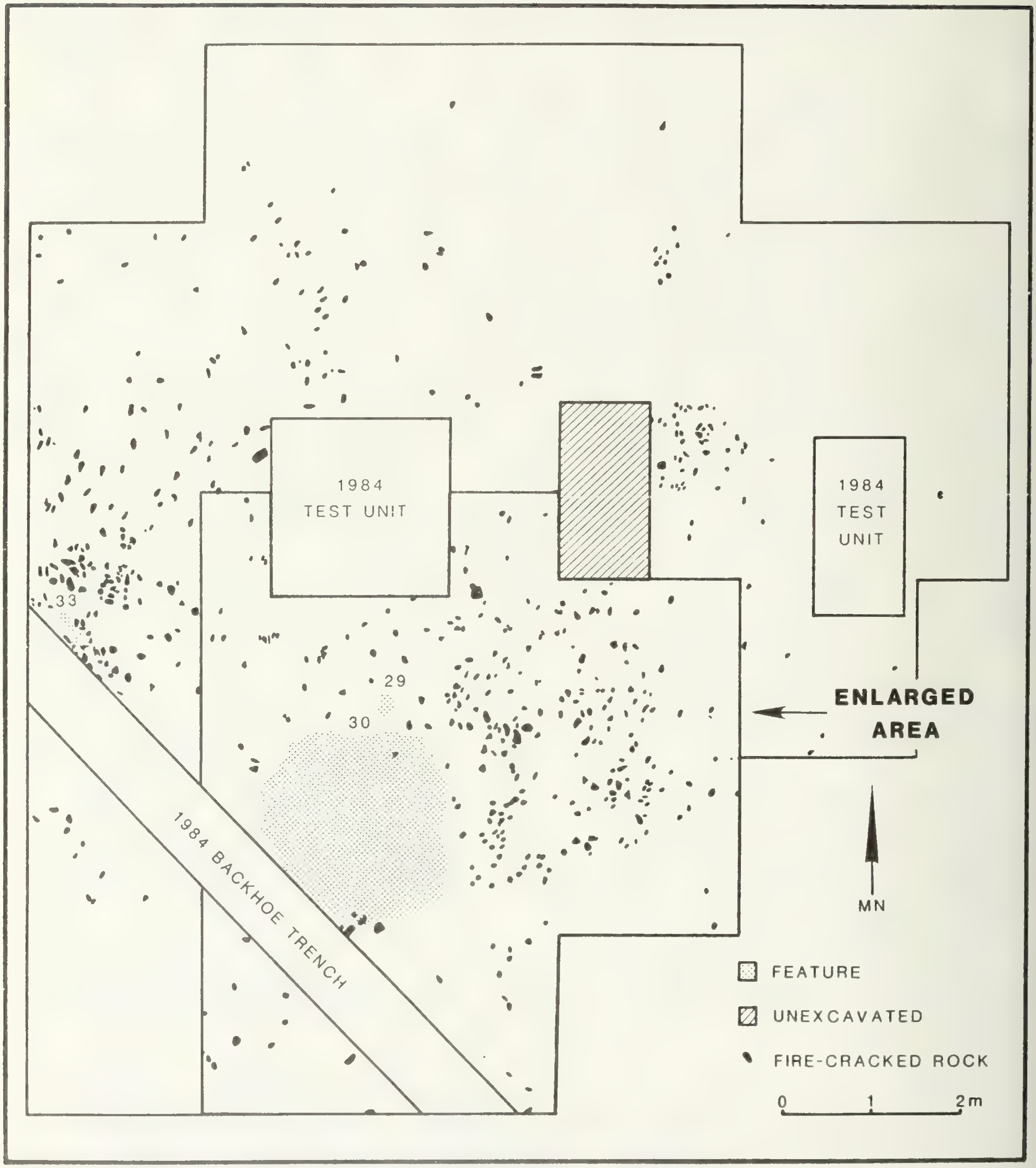


Figure 83. Plan map of the south half of Excavation Area A showing distribution of features and fire-cracked rock, Component VI, Taliaferro site. The location of the area enlarged on the next figure also is shown.

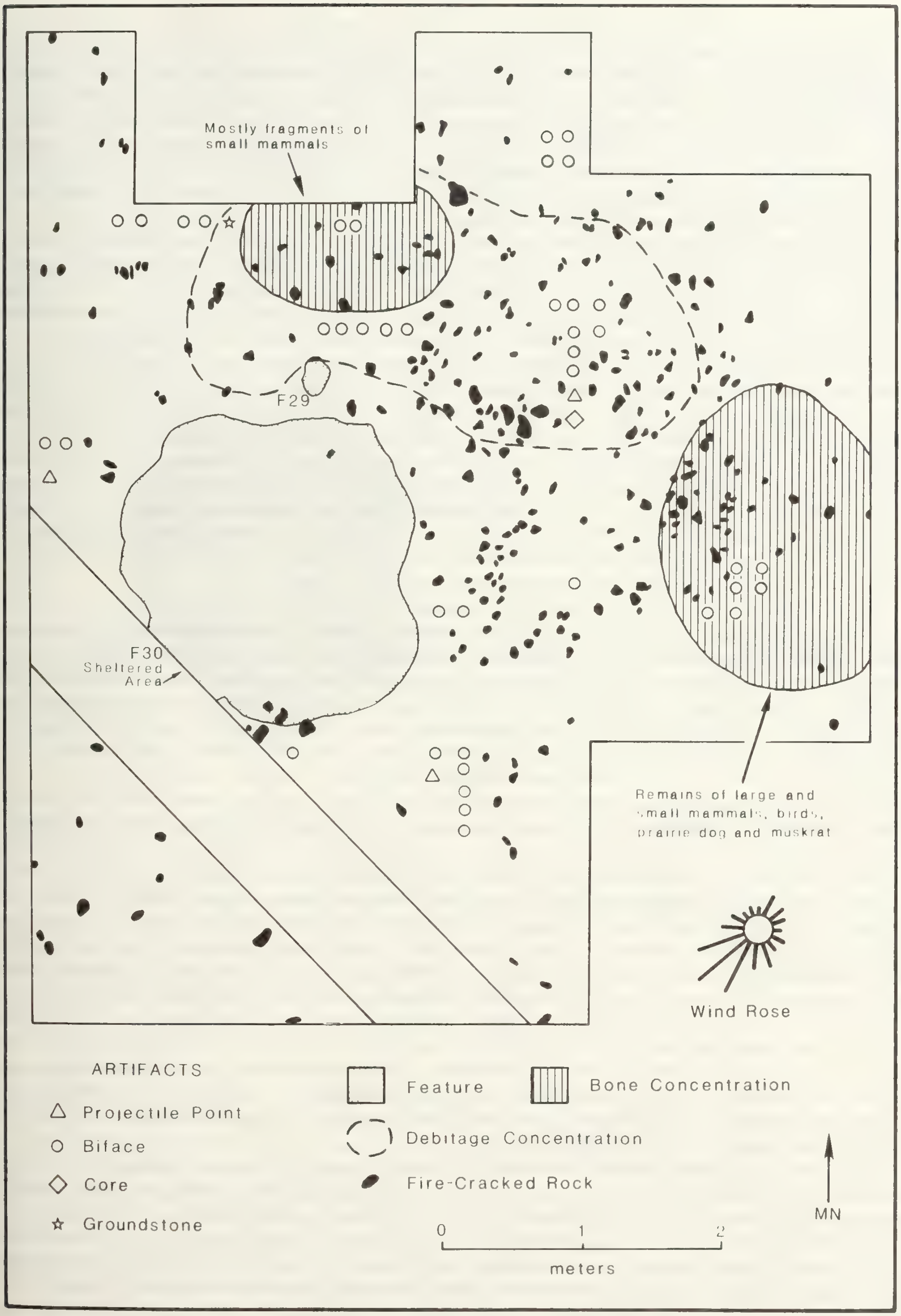


Figure 84. Plan map of a portion of the south half of Excavation Area A showing spatial relationship of features, fire-cracked rock, flaked stone tools, debitage, and bone concentrations, Component VI, Taliaferro site.

and nonutilitarian artifacts such as an incised sandstone fragment and a bone bead indicates that the feature was the center of several other activities. Because most of the debitage were small pieces found in the fine screen, the sheltered area was a primary drop zone of flaking or maintenance of stone implements. According to Binford (1983), the smaller debris are left in the primary activity area while the larger pieces are dumped or thrown out of the way. In addition to these activities, the occupants probably "huddled" together in the sheltered area at night.

Ethnoarchaeological studies of modern hunters and gatherers have shown that many of the day-to-day endeavors take place in the areas next to the structures (Binford 1978b, 1983; O'Connell 1987; Yellen 1977). At the Taliaferro site, several kinds of activities probably occurred in the leeward area of Feature 30, in front of the shelter. This area was downslope and to the north and east of the feature and was covered with a scatter of fire-cracked rock. In contrast, the areas around the western and southern side of Feature 30 had only a few isolated rocks. Apparently the windbreak, or structure, opened toward the north and east where the fire-cracked rocks were scattered. Interestingly, the fire-cracked rocks were scattered over the entire area and distinctive work areas surrounded by a toss zone of rock were absent. There appears to have been no effort to maintain rock-free work localities in front of the shelter. This strongly indicates that the primary work area occurred within the structure and the area in front served as the toss zone for refuse disposal.

As within the shelter, the winnowing, threshing, and charring of seeds was also performed in these outside areas. High frequencies of Cheno-am pollen from occupation floor samples taken from around the eastern and northern sides of Feature 30 indicate that goosefoot was processed outside the structure. The area to the northeast of the shelter containing a concentration of stone tools and debitage may have been a men's workshop locality where flaked stone implements were manufactured. According to O'Connell's (1987) ethnoarchaeological studies among the Alyawara of Australia, the production and maintenance of tools often occurred in areas lacking a hearth. Only activities that require the use of fire were conducted near a firepit.

The two concentrations of bone associated with Feature 30 probably represent dumps of unwanted debris. The remains were most likely from the roasting or boiling of small animals and the production of bone grease or juice from the larger bones. The presence of large quantities of fire-cracked rock indicates that water was boiled in baskets either for making mush from ground seeds, for cooking of small animals, or for making bone juice. Probably all three activities were performed in the area. All the identifiable muskrat and prairie dog, and most of the bird bone for the component, was recovered from the eastern bone concentration, which suggests that these species were processed in the vicinity. The concentration of projectile points and bifaces located southeast of the structure may have resulted from some unknown activity.

The area centered around Feature 30 and shown in Figure 84 appears to be a family household activity area as described in the ethnoarchaeological literature (O'Connell 1987; Yellen 1977). In these areas, most of the day-to-day endeavors conducted by a household took place. Each family unit occupying the site would have inhabited and used such space. Specialized activity areas where bulky resources were processed usually were located at other localities within the site. The complete settlement layout of the Taliaferro site probably includes several household activity areas similar to the one excavated and discussed above.

The household activity area excavated at the Taliaferro site was situated on the leeward, eastern slope of a sand shadow. This location was relatively protected from the almost constant wind from the west and southwest. The exposed portion of the activity area covers about 40 to 50 m^2. At the Buffalo Hump site in the Great Divide Basin, housepits with household activity areas dating to the Late Prehistoric period also occurred on the leeward slope of a sand shadow (Harrell 1987). Unlike the one at the Taliaferro site, those at the Buffalo Hump site contained interior and exterior pits and hearths. The remains of the activity areas also were slightly larger, measuring about 60 m^2.

In summary, Feature 30 and associated remains from the Late Prehistoric Component VI probably represent a family household activity area. The large stratified basin, Feature 30, had a sagebrush shelter or windbreak and was the center of several intensive activities. These activities included the processing of seeds for winter stores, roasting and boiling small animals, producing bone grease or juice, maintenance of flaked stone implements, and sleeping. Additional processing and manufacturing activities probably took place in the areas surrounding the structure.

COMPARISONS BETWEEN COMPONENTS

Because the Taliaferro site contains eight components dating between 5200 and 960 years ago, it is ideal for the examination of changes through time. In this section, the changes through time in the flaked stone artifacts, other artifacts, and plant and animal remains are summarized. Some of the changes are considered in the next section that discusses the chronology for the area.

Flaked Stone Artifacts

Many of the morphological projectile point types from the Taliaferro site are limited to distinct chronological periods, thereby providing temporal markers for southwest Wyoming. The sequence of these points can be refined with further research in the area. The different preform types, the notched knives, and the Type I distal retouched flakes also tend to mark certain periods in the prehistory of the site. All stages in the bifacial reduction of stone implements occurred at the residential camp. Additionally, the material type favored for the manufacture of stone tools changed through time as did the overall size of the various bifaces.

Projectile Points

The major concern of the analysis of projectile points from the Taliaferro site was the deliniation of morphological types for chronological purposes. The points were grouped into several descriptive categories following Holmer (1986) and compared to named types from the Great Basin, northern Colorado Plateau, and the Great Plains. Many of the point types correspond to distinctive chronological periods. The distribution of each point type by component at the Taliaferro site is shown in Figure 85. The bars in the figure indicate the percent of each type present in a particular component. A more detailed discussion of the point types is provided in Appendix B.

As can be seen in Figure 85, Type I large, side-notched points occur only in the Early Archaic Component I dating to 5200 years ago. They resemble

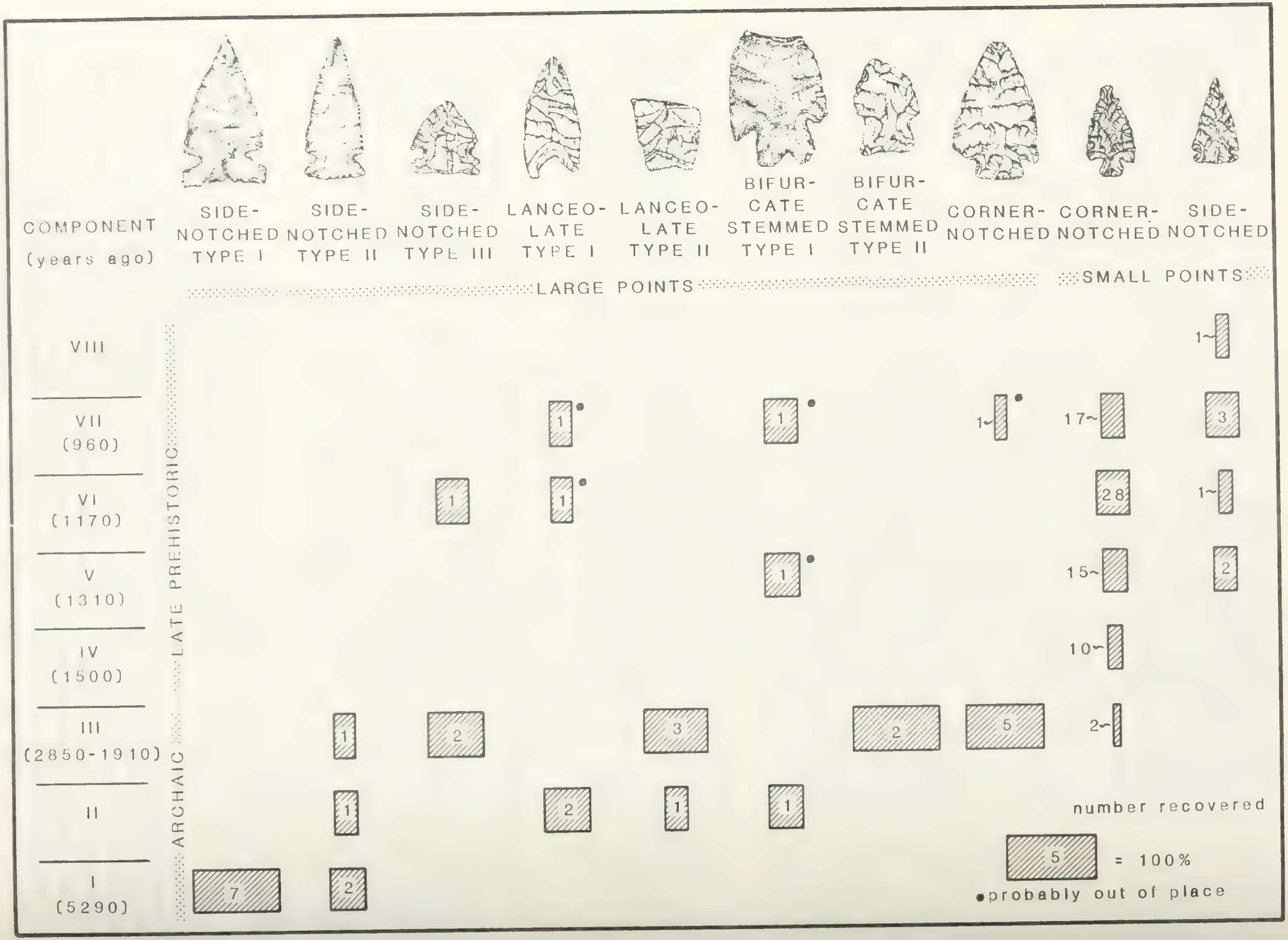


Figure 85. Distribution of projectile points by type, Taliaferro site.

points that are often referred to as Northern Side-notched (Gruhn 1961), Bitterroot Side-notched (Swenson et al. 1964), and Mummy Cave Side-notched (McCraken et al. 1978) in the archaeological literature. The Type I points from the Taliaferro site have a similar age as those in surrounding regions.

The five Type II large, side-notched points were found in the Early to Late Archaic period Components I-III at the Taliaferro site. These points are similar to those referred to as Elko Side-notched points in the Great Basin (Heizer et al. 1968). In the eastern Great Basin they date between 6000 and 3200 years ago, and they range between 3300 to 1300 years ago in the western Great Basin (Holmer 1986). The long time span from 5200 to 1900 years ago for Type II side-notched points at the Taliaferro site is consistent with the evidence from the Great Basin.

Two of the three Type III large, side-notched points belong to the Late Archaic Component III. The remaining one, which has been resharpened, was found in the Component VI deposits just above those of Component III. Either the point is out of place due to mixing, picked up and reused, or the point type also was used in the early part of the Late Prehistoric. The Type III points compare in shape to the Avonlea type from the Northwestern Plains (Kehoe and McCorquodale 1961). Avonlea points usually occur somewhat later in time than the Type III points from the Taliaferro site; however, on the Northwestern Plains, Avonlea points often are associated with the earlier Pelican Lake Corner-notched variety (Reeves 1983). The Type III side-notched points at the Taliaferro site also occur in the same component as corner-notched points similar to the Pelican Lake type.

Of the four Type I lanceolate points recovered from the Taliaferro site, two belong to the Middle Archaic Component II and the other two were found in Late Prehistoric contexts. These later two are probably out of place. They resemble McKean Lanceolate points from the Northwestern Plains (Mulloy 1954; Wheeler 1952). McKean Lanceolate points are part of the McKean Complex and roughly date between 5000 and 3000 years ago. This corresponds to the age of the Type I lanceolate points from the Taliaferro site associated with Component II.

At the Taliaferro site, Type II lanceolate points are present in Components II and III, and three of the four are in the Late Archaic Component III. These points are similar to the Humboldt Concave Base from the Great Basin (Heizer and Clewlow 1968). Humboldt Concave Base points occur in deposits dating between 7300 and 1300 years ago at Hogup Cave (Aikens 1970) and have an age from 4300 to 1300 years ago at Gatecliff Shelter (Thomas 1983). The Type II points from the Taliaferro site, dating from 5000 to 1900 years ago, fit into this admittedly long time span.

One each of the Type I bifurcate-stemmed points were found in Components II, V, and VII. The ones from the Late Prehistoric Components V and VII probably originated from the Middle Archaic Component II and were collected for reuse. Similar points are referred to as Pinto or Gatecliff Split Stem in the Great Basin literature and as Duncan in the Northwestern Plains (Amsden 1935; Wheeler 1954). The Type I point from Component II has a similar age as the Duncan and the Gatecliff Split Stem and the later range of the Pinto series. Both Type II bifurcate points belong to the Late Archaic Component III at the Taliaferro site. These points resemble the Hanna type, a part of the McKean Complex assemblage on the Northwestern Plains. Though Hanna points are generally thought to date to the Middle Archaic period on the Northern and Northwestern Plains, they often are found with Pelican Lake Corner-notched points, indicating that they may occur later in time than the other McKean Complex point types (Mulloy 1954; Reeves 1978). At the Taliaferro site, they also are associated with corner-notched points similar to the Pelican Lake type.

Five of the six large, corner-notched points from the Taliaferro site are part of the Late Archaic Component III assemblage. The remaining one was found in the Late Prehistoric Component VII. Large, corner-notched points usually are assigned to the Pelican Lake type on the Northwestern Plains series and to the Elko series in the Great Basin (Heizer and Baumhoff 1961; Wettlaufer 1955). The large, corner-notched points from the Taliaferro site date between 2800 and 1900 years ago, which corresponds to the chronological placement of the Pelican Lake type on the Northwestern Plains as well as in part to the Elko series in the western Great Basin. Except for sites such as Deadman Wash (Creasman 1984) and Sweetwater Creek (Newberry and Harrison 1986), most large, corner-notched points date within this range (Frison 1978).

Small, corner-notched points are present in the Late Prehistoric Components IV-VII. Seventy of these small points were recovered from the Late Prehistoric components, and an additional two are part of the Late Archaic Component III assemblage. In the Great Basin and northern Colorado Plateau, small, corner-notched points usually are referred to as Rose Spring, Eastgate, or Rosegate (Heizer and Baumhoff 1961; Lanning 1963; Thomas 1981). They are common throughout the Intermountain West and occur from about 1600 to 950 years ago in the eastern Great Basin and northern Colorado Plateau (Holmer and Weder 1980). The small, corner-notched points dating between 1500 and 960 years ago from the Taliaferro site are of similar age. Most Late Prehistoric period sites in southwest Wyoming also contain Rose Spring points (Bower et al. 1986; Hoefer 1986; Schroedl 1985).

The Late Prehistoric Components V-VIII each produced at least one small, side-notched projectile point. Except for the one from Component VIII, these points resemble the Uinta Side-notched, common at Fremont sites on the northern Colorado Plateau, and the Prairie Side-notched, common in the Northern Plains (Holmer and Weder 1980; Kehoe 1966). Similar points dominate the flaked stone artifact assemblage from the Wardell Buffalo Trap in southwest Wyoming (Frison 1973). The specimen from Component VIII appears to be a Desert Side-notched point, which is usually associated with Shoshoni period sites (Holmer and Weder 1980).

Other Flaked Stone Artifacts

In addition to projectile points, the preform types from the Taliaferro site tend to have some chronological distinction. As detailed in the preform analysis section of Appendix B, chi-square and Cramer's V statistics were computed which indicate that significant differences exist in the preform types with respect to component. There is even a stronger correspondence between preform type and component when Component VI is excluded. Component VI contains material from several Late Prehistoric occupations, thereby masking the trends in the preform types through time. In the following discussion on preforms Component VI is not considered.

Large preforms dominate in the three Archaic components, and this is the only type represented in the Early Archaic Component I. They are also a constituent of the flaked stone artifact assemblage from the Late Prehistoric period components. Type I small preforms, which are relatively long and narrow, were recovered from the Middle Archaic Component II through the Late Prehistoric Component IV. They are absent in Components V-VIII. The Types IIa and IIb small preforms are shorter than the ones classified as Type I and are present in the Late Archaic Component III through the Late Prehistoric Component VII. Type IIa preforms are most common in Components IV and V, and

Type IIb dominates in Component VII. The Type III small preforms occur in Component V, and the only Type IV preform belongs to Component VII.

Among the other artifact types that have a limited chronological distribution are the Type I distal retouched flakes. The five recovered from the Taliaferro site belong to the Early Archaic Component I. These artifacts, often referred to as "hafted end scrapers," contain obvious notches for hafting and have edge angles ranging from 75 to 85 degrees. A similar retouched flake was found in Component II at the Maxon Ranch site, dating from 4860 to 4760 years ago (Harrell and McKern 1986). The five large, notched knives from the Late Prehistoric Component VI are another artifact type unique to a single component. These artifacts are all corner-notched and made of opaque algalitic chert. Similar hafted bifaces are part of the artifact collection from the Late Prehistoric period Austin Wash site (Schroedl 1985). Most of the other artifact types, including preblanks, blanks, retouched flakes, and cores, are present throughout much of the prehistory of the Taliaferro site.

The most common technique of flaked lithic tool manufacture evident throughout all occupations at the Taliaferro site was bifacial reduction. With this method, a cobble is bifacially reduced through a series of steps to create an end product. The continuum of biface production as illustrated by Holmes (1919:Figure 49) is divided for the analysis in this report, from first to last stages, into preblanks, blanks, preforms, and end products. The other two flaked stone tool reduction sequences present in the archaeological record at the site are the retouching or use of flakes that are removed from a cobble or core (core-flake-tool) and the expedient modification of cobbles or pebbles for tools. These two reduction sequences were of only minor importance in most components. Based on the number of recovered end products compared between components, the retouching of flakes appears to have been most common during the Early Archaic Component I, and the modification of cobbles was most important in Components I and VII.

The cumulative percent (Figure 86) of the preblanks, blanks, preforms, and end products occurring in each component provides a means to measure the degree of reduction activity, i.e., whether all or only a part of the reduction sequence is represented. The ideal quarry and tool finishing curves are also shown in Figure 86. According to Thomas (1983), most bifaces found at a quarry site, where mostly the early stages of reduction are conducted, are preblanks. The cumulative curve of the artifacts found at a quarry site should have high percentages of preblanks and low percentages of the later biface stages. In contrast, a site where implements were only retouched would contain primarily end products and should produce a curve with high percentages of bifaces belonging to the last stages of reduction. A residential camp, such as the Taliaferro site where tools were produced, maintained, and rejected, should have a cumulative curve that falls between the other two.

As can be seen in Figure 86, the curves from the seven components occur in the middle of the plot as would be expected if all stages in the reduction sequence were conducted at the residential camp. Further evidence for the entire reduction sequence at the Taliaferro site comes from the cumulative percents of the various debitage types. Generally, each component contains about 57% tertiary flakes, 22% secondary flakes, and 11% primary flakes. As shown by the cumulative percent curves in Appendix B, these percentages correspond to the expected ratio of flake types if all stages in the bifacial reduction sequence were performed at the site. Because the flake types were defined using the presence or absence of cortex, most flakes resulting from

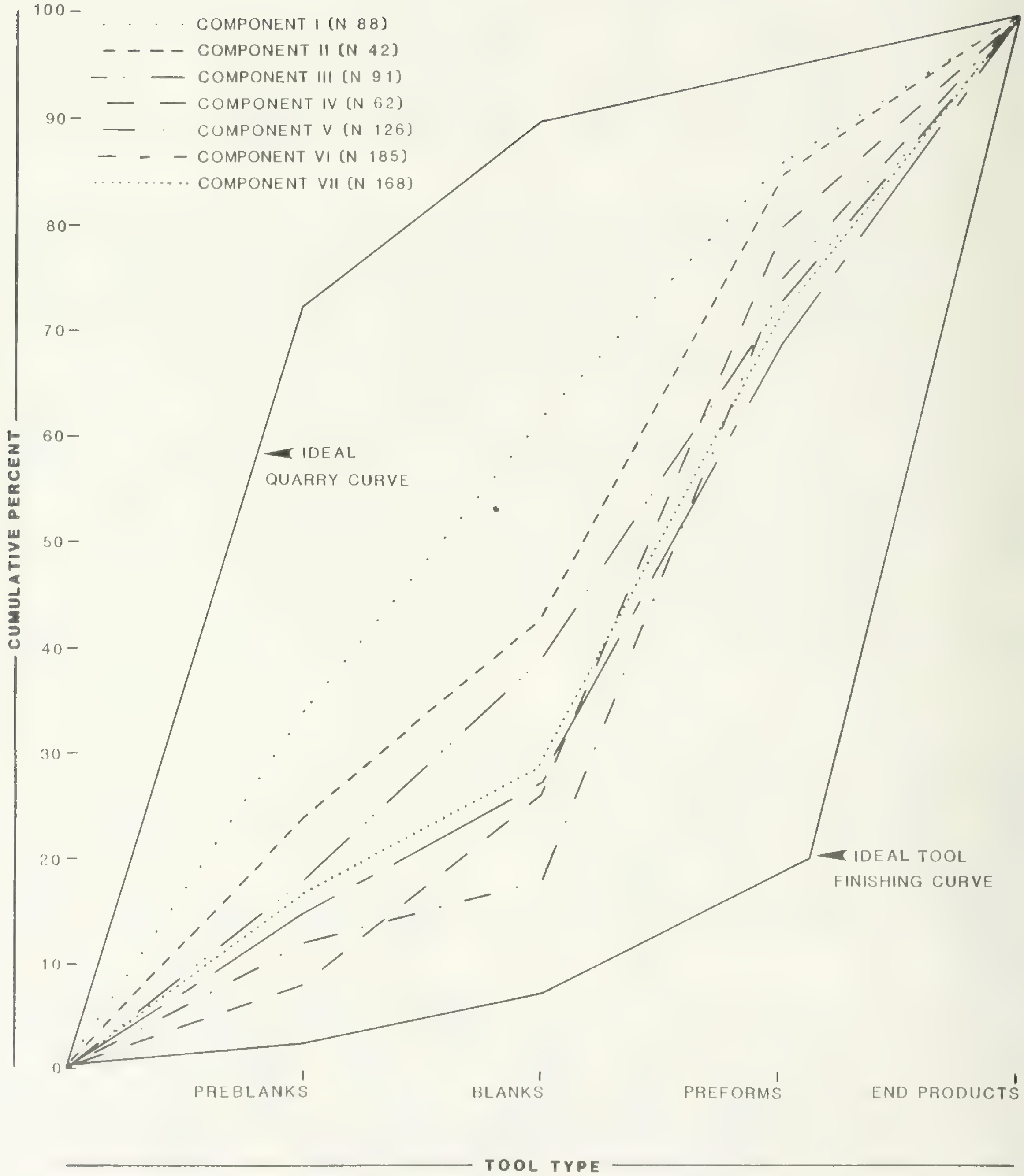


Figure 86. Cumulative percentage curves of preblanks, blanks, preforms, and end products for each component at the Taliaferro site. Also shown are the ideal curves for a quarry and tool finishing site.

the production of flaked stone tools would be classified as tertiary. A site where the final retouching of implements was the major activity would have even lower percentages of primary and secondary flakes than observed at the Taliaferro site.

The quartzite and algalitic chert cobbles common on the terraces in the vicinity of the Taliaferro site were the chosen material types for implements during prehistoric times. A primary focus of the flaked stone artifact analysis for this site was the examination of significant changes through time in the favored material type. For most artifact types, chi-square and Cramer's V statistics were computed for the contingency tables of component by material type. Except for preblanks, there were significant differences between the components in the material types for the artifacts produced in the bifacial reduction sequence.

The differences in material types by component are clearly shown in Figure 87. Quartzite is the most important material for flaked stone artifacts in the Early Archaic Component I. For the Middle and Late Archaic Components II and III, the material types are more evenly distributed among translucent and opaque algalitic chert and quartzite. A majority of the flaked stone artifacts from the Late Prehistoric period are of translucent algalitic chert. Differences also occur in the material types of the debitage by component. Quartzite is most common in each of the three Archaic components, and translucent algalitic chert is the most important material during the Late Prehistoric period.

Another concern of the flaked stone artifact analysis was determining if there were significant changes through time in the size of the recovered artifacts. For each artifact type represented in the bifacial reduction sequence, the Kruskal-Wallis one-way analysis of variance was used to statistically measure whether the means of the length, width, and thickness are different between the components. This test showed that significant differences do exist between components in the size of the preblanks, blanks, and preforms. Generally, the bifaces are larger in the Archaic period than in the Late Prehistoric period components.

The changes in the favored material type through time at the site are probably the result of the desired size of the final biface implement. Of the cobbles in the vicinity of the Taliaferro site, only quartzite cobbles occur in large enough sizes to produce the larger artifacts belonging to the Archaic period. Because they were interested in smaller tools, the Late Prehistoric peoples took advantage of the small, more flakable, translucent algalitic chert pebbles.

Other Artifacts

The Late Prehistoric components contain the greatest variety and largest number of groundstone artifacts. Only one or two unclassifiable groundstone fragments were recovered from the Early and Middle Archaic Components I and II. The Late Archaic Component III produced three manos, a metate, and indeterminate fragments. The groundstone assemblages from the Late Prehistoric components are fairly similar and contain shaped and unshaped manos and metates. The only abrading stone was found in Component VII, and Component VI produced the only basin metate for the site. The distribution of groundstone implements through time parallels the results of the plant macrofossil analysis which indicates increased use of plant foods during the Late Prehistoric periods in relation to the Archaic periods.

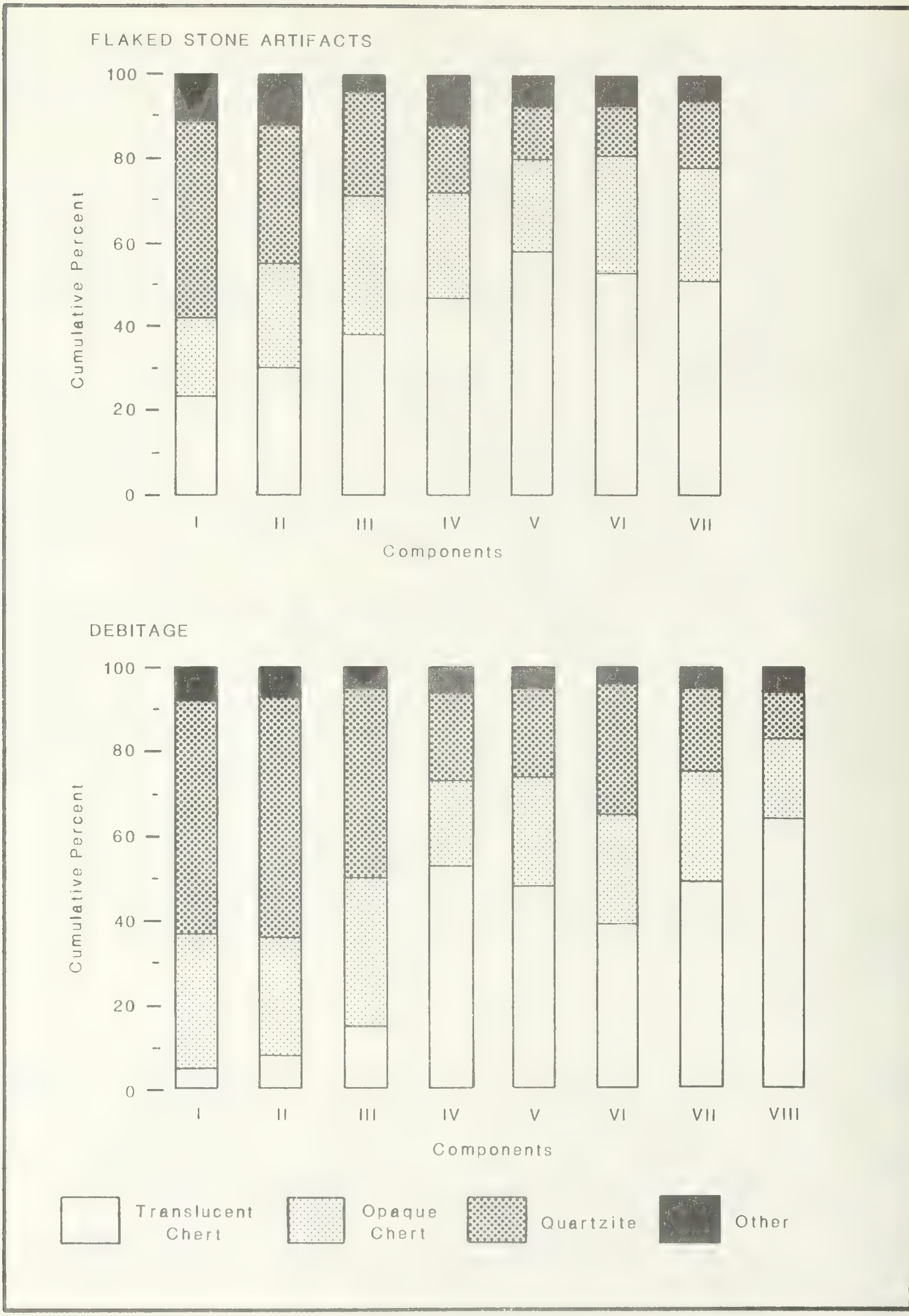


Figure 87. Cumulative percents of material types for flaked stone artifacts and debitage by component, Taliaferro site.

All the nonutilitarian artifacts recovered during the excavations belong to the Late Prehistoric components. Stone beads were found in Components IV, V, and VI. Component VIII produced the only shell bead, and the two bone bead fragments are from Components V and VI.

Plant Remains

Feature fill from Components I-VII was floated and examined for plant macrofossils. Except for the Middle Archaic Component II, all components yielded charred seeds. A single sedge seed was found in the Early Archaic Component I, and the Late Archaic Component III produced 34 seeds of which 33 were identified as goosefoot. By far, most of the charred seeds from the Taliaferro site were recovered from the Late Prehistoric components. In total, 19 taxa were identified. These were dominated by goosefoot. Goosefoot is a weedy annual which invades disturbed areas, cultivated places, and waste areas and can produce up to 100,000 seeds per plant. Other weedy species represented in the plant macrofossil collection include beeweed, sunflower, monolepis, and mustard family. Grass seeds, including Indian ricegrass, are also an important component of these assemblages.

The evidence from the plant macrofossil analysis indicates that there was a marked change in the subsistence base of the prehistoric inhabitants between Archaic and Late Prehistoric times. By Late Prehistoric time, seed foods became an important part of the diet. Seeds were extensively processed at the Taliaferro site. The pollen record from feature samples also suggests that seeds from such species as goosefoot were used in the vicinity of the features during the Late Prehistoric period. Besides the recovery of a few charred seeds, information concerning plant use at the site during the Archaic period comes from pricklypear pollen found in the two features belonging to the Early Archaic Component I. Liliaceae family pollen from a piece of groundstone suggests that roots or bulbs of a lily were ground at the site during the Late Archaic Component III times.

The shift to seed foods during the Late Prehistoric period may be the result of humans intentionally or accidentally creating disturbed areas for the weedy annuals. Many of the species represented in the plant macrofossil collection are rare in the modern vegetation of the area and occur mostly in recently disturbed areas. To produce stands large and dense enough for profitable exploitation of these plants, areas had to be regularly reduced back to the first stages of plant succession. Humans could have created suitable environments fortuitously during their day-to-day activities at the site. They may actually have encouraged weedy species using such methods as burning off the vegetation and broadcasting seeds.

Animal Remains

A total of 1265 specimens of bone, teeth, and shell was recovered from the eight components at the Taliaferro site. The scanty number of specimens from the Early and Middle Archaic Components I and II limits the interpretations for these periods. Only one large mammal bone fragment was recovered from the Early Archaic Component I, and the Middle Archaic Component II produced only 16 specimens; these represent unidentified large and small mammals and freshwater mollusk. Of the 84 specimens from the Late Archaic Component III, bison and pronghorn are the only identified species. The remaining unidentified specimens are mostly unspecified artiodactyls and large mammals. This meager evidence indicates that during the Late Archaic period, the prehistoric inhabitants focused on large animals such as bison and pronghorn.

The Late Prehistoric components produced a more varied and larger sample than those of the Archaic period. Though large mammal bones still dominate the collection from most Late Prehistoric components, a variety of small animals are represented as well. In Component IV, the earliest Late Prehistoric component, bison and pronghorn are the favored large mammals, which is similar to the Late Archaic Component III. In addition, eight taxa of small animals were exploited, including jackrabbit, cottontail, muskrat, ground squirrel, vole, sage grouse, sucker, and freshwater mollusk. Animals were obtained from both upland and riparian environments.

For Component V (1310 years ago), remains of pronghorn and mule deer are present, bison is absent in the collection, and pronghorn dominates. Small animal remains represent fewer taxa than the previous component but include jackrabbit, cottontail, sage grouse, and egg and mussel shell. Pronghorn and mule deer are the large animals identified for the Late Prehistoric Component VI; however, unlike other components, there are greater numbers of specimens from small animals. Identified small animals include jackrabbit, cottontail, muskrat, prairie dog, ground squirrel, sage grouse, sucker, and freshwater mollusk. Component VII, dating to 960 years ago, produced remains of bison, mule deer, and pronghorn; pronghorn was the most common. The only small animals include jackrabbit, cottontail, and mussel. The 18 specimens from Component VIII were identified to prairie dog and large and small mammal.

Apparently a wide range of animals from several environmental niches were exploited by the prehistoric inhabitants of the Taliaferro site during the Late Prehistoric period. The Late Archaic people concentrated on large game, though the cooking and processing of animals at the site was probably only a minor activity as evidenced by the meager recovery of bone. Because Components V and VI lacked bison bone, this species may have been unavailable (or perhaps unexploited) to the occupants of the site during the middle portion of the Late Prehistoric period.

CHRONOLOGY

One of the research concerns for the Exxon LaBarge Project excavations is the development and refinement of the cultural chronology for southwest Wyoming (Creasman et al. 1985). The cultural history of southwest Wyoming usually is treated as part of the broader scheme for the Northwestern Plains as defined by Frison (1978). This five-part sequence includes the Paleo-indian, Early Plains Archaic, Middle Plains Archaic, Late Plains Archaic, and the Late Prehistoric periods. Because of similarities to the Great Basin and northern Colorado Plateau in the archaeological record of southwest Wyoming, the term "Plains" is often dropped from the names for the Archaic periods in the scheme (Schroedl 1985; Zier et al. 1983). Frison's cultural chronology, without the term Plains, is followed in the descriptions and discussions throughout this report. Using the Northwestern Plains sequence facilitates comparisons with the previous research in the area, which usually relies on this chronology.

Generalizing the data from southwest Wyoming into the broad scheme, however, tends to mask any local developments in the prehistory. Southwest Wyoming is often considered as a fringe or frontier of the Northwestern Plains or Great Basin, and local adaptations are ignored. To overcome this problem, Zier et al. (1983) have devised a cultural historical scheme focusing specifically on southwest Wyoming. This chronology is based primarily on the frequency distribution of radiocarbon dated components. Figure 88 details the scheme proposed by Zier et al. (1983) compared to the periods and dating of Frison (1978). Also shown is the radiocarbon age frequency curve for sites in southwest Wyoming used by Zier et al. (1983) in developing this sequence. The curve indicates the relative occurrence of available dates per 200-year time segment. They assume that the frequency of dates reflects the general trends in intensity of occupation.

Unfortunately, the cultural historic scheme for southwest Wyoming is based primarily on the radiocarbon age frequency curve and lacks detail on changes of artifact types and subsistence and settlement patterns. To add a little substance to the scheme, each phase proposed by Zier et al. (1983) is considered in relation to the data from the Taliaferro site as well as other excavated sites in the area and region. The following discussion is only the beginning in the development of a cultural historical chronology, and a more extensive endeavor needs to be performed. Because most information on the Paleoindian period comes from outside the area, this period is not considered in the summary.

Great Divide Phase

According to Zier et al. (1983), the Great Divide phase dates from about 7000 to 5800 years ago. The Taliaferro site lacks material dating to this phase, so the following is based solely on information from other excavated sites in the area. Component I at the Maxon Ranch site, dating to 6480 and 6000, probably provides the most detail presently available for the Great Divide Phase (Harrell and McKern 1986). The excavation of this component produced the remains of 16 pit features, including a housepit with interior features. Most features were unlined basins that probably served a variety of functions. The flaked stone artifacts include an Elko Eared projectile point, three final bifaces, nine preforms, a retouched flake, and seven utilized flakes. Though only one indeterminate piece of groundstone was recovered, the presence of charred chokecherry and juniper seed fragments indicates that some plants were used at the site. The processing of animals for meat, marrow, and bone grease and juice was an important activity at the Maxon Ranch site as attested by the recovery of a fairly large sample of bone and teeth, most of which are unidentifiable fragments. Identified taxa include mule deer, cat, jackrabbit, cottontail, and ground squirrel, suggesting that both large and small mammals formed a portion of the subsistence base. During Component I times, the site most likely functioned as a residential camp occupied during the winter or early spring months.

Two of the three radiocarbon dates, 6840 and 6000 years ago, from Component III at the Deadman Wash site fall within the Great Divide phase; the remaining one belongs to the later Green River phase (Armitage et al. 1982). The component contains a variety of firepits and special use pits, flaked stone tools and groundstone, and a small sample of bone identified to jackrabbit, ground squirrel, and mule deer. Among the projectile point types are Northern Side-notched; Elko Side-notched; Elko Corner-notched; and Elko Eared, which are similar to those from the Maxon Ranch site (Creasman 1984).

Another site which provides some information for the Great Divide phase is Component I at 48SW5019 with an age of 6150 years ago (Creasman et al. 1983). Cultural material includes several basin-shaped firepits, a projectile point fragment, a preform, an indeterminate biface, and two bone beads. Cottontail and jackrabbit were identified from the recovered bone, some of

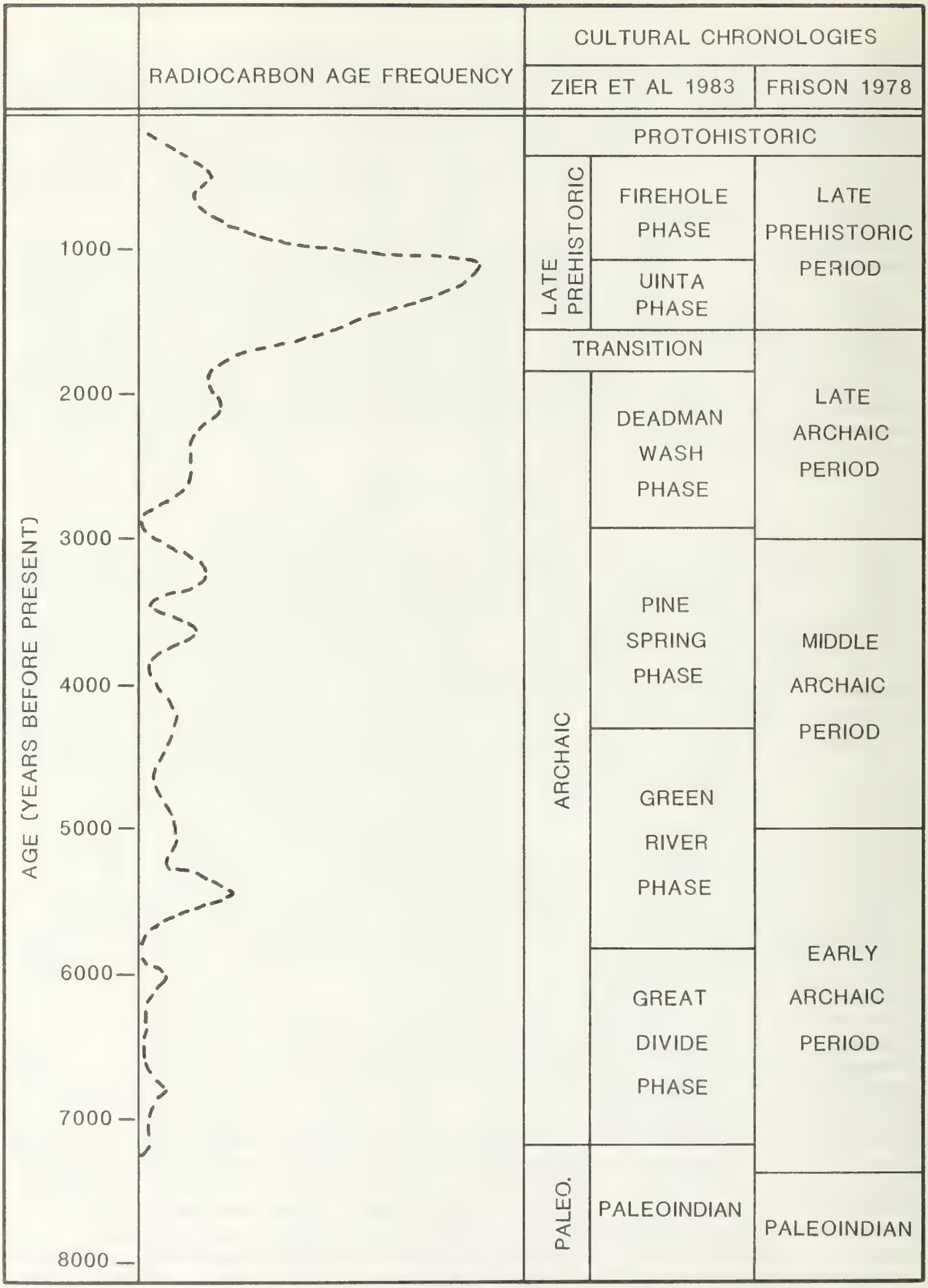


Figure 88. The Zier et al. (1983) cultural historical scheme with radiocarbon age curve for sites in southwest Wyoming compared with Frison's (1978) chronology for the Northwestern Plains.

which was found in firepits. Among sites which have limited excavations and information is 48UT372 dating to 6870 years ago (Bleacher 1982). A charcoal stain with artiodactyl bone was the only cultural material encountered during the excavations. Other sites with radiocarbon ages falling into this phase are 48SW1153 (Miller 1982) and 48CR1946 (Sender et al. 1982).

As is obvious from the above descriptions, information from archaeological sites in southwest Wyoming concerning the Great Divide phase is meager. During the Great Divide phase, the prehistoric inhabitants of southwest Wyoming occupied housepits for at least part of the year, produced large, side- and corner-notched projectile points, and favored small mammals such as cottontail, jackrabbit, and ground squirrel. Mule deer is the only large mammal identified from the recovered bone. The only evidence for the use of plants comes from the presence of charred chokecherry seed fragments and groundstone implements; seeds from weedy species such as goosefoot were apparently unimportant in the subsistence base.

The small sample of cultural remains from the Great Divide phase is similar to that occurring at sites dating to the following Green River phase. Both Early Archaic phases have housepits; large, side- and corner-notched projectile points; and similar plant and animal remains. The only evidence used by Zier et al. (1983) to separate the two phases is a lag in the radiocarbon age frequency curve at 5800 years ago. The archaeological record from the surrounding regions lacks discernible differences within the Early Archaic period as well. For example, Mummy Cave in northwestern Wyoming has a similar assemblage with large, side-notched projectile points throughout the Early Plains Archaic in Cultural Layers 12 through 24, which date between 7630 and 5255 years ago (McCracken et al. 1978). Further research needs to be performed to determine if differences actually exist between the two Early Archaic phases as proposed by Zier et al. (1983).

Green River Phase

The next phase in the Zier et al. (1983) scheme is the Green River phase which dates between 5800 and 4800-4300 years ago and includes the latter portion of the Early Archaic period. Component I at the Taliaferro site, with an age of 5200 years ago, belongs to this phase. Component I yielded large, side-notched projectile points; large preforms; other bifaces; retouched flakes, including hafted end scrapers; modified cobbles; cores; and groundstone. A single charred sedge seed was recovered, and a wall fragment from a large mammal was the only bone from the component. Pricklypear pollen from feature samples indicates that the stems or fruits of this taxon was processed and consumed at the site. The site during this time probably was a short-term residential camp that was occupied during the late summer and fall.

Other excavated sites in southwest Wyoming dating to the Green River Phase have assemblages similar to that of the Taliaferro site. One site providing information for this phase is Component II at the Maxon Ranch site dating to 4860 and 4760 years ago (Harrell and McKern 1986). Component II contained a housepit with interior features; unlined basin-shaped pits; large, side-notched projectile points; other flaked stone tools; groundstone; and charred chokecherry seed fragments. A retouched flake similar to the hafted end scrapers recovered from Component I at the Taliaferro site also is part of the assemblage. Mule deer and pronghorn are the large mammals identified from the animal remains. Of the large mammals, mule deer appears to be most important at the site during this phase. Identified small mammals include jackrabbit, cottontail, and ground squirrel. Component II at Maxon Ranch most likely was inhabited in the late winter and spring.

Component 1 at the Sweetwater Creek site (Newberry and Harrison 1986) with an age of 5130 years ago is another site belonging to the Green River phase. This component also has a housepit with an interior, slab-lined hearth as well as exterior pit features. Projectile points include both large, side- and corner-notched types. Among the other implements are preforms, blanks, preblanks, cores, and an unidentified groundstone fragment. The small sample of bone contains those identified as cottontail. The features from this component lacked charred seeds, and the pollen record suggests that beeweed, goosefoot, and pricklypear may have been processed in the vicinity of the housepit. The site probably was a residential camp used during early to late spring.

Components IV, V, and possibly VI at the Deadman Wash site may be associated with the Green River phase. The components were not radiocarbon dated, but lag between components dated to 6840-5530 B.P. (Component III) and 2870 and 2140 B.P. (Component II) (Armitage et al. 1982). Large, side-notched, corner-notched, and split-stemmed projectile points are among the recovered flaked stone artifacts (Creasman 1984). Large quantities of groundstone were part of the assemblage as well. The identified taxa represented by the bone are jackrabbit, ground squirrel, and mule deer.

Two sites excavated along the Trailblazer pipeline produced radiocarbon age estimates that fit into the Green River phase (Creasman et al. 1983): 48SW1900 dates to 5510 years ago, and 48SW4491 has an age of 5520 years ago. A utilized flake and bone needle were the only artifacts found around the single feature at 48SW1900. Bones of cottontail and a large-medium animal were also found. Excavations at 48SW4491 yielded 17 features including firepits, pits, and fire-cracked rock concentrations. Large, side- and corner-notched projectile points; a large, side-notched knife; a utilized flake; and pieces of groundstone are among the recovered artifacts. Taxa identified from the bone are jackrabbit, cottontail, and ground squirrel. One charred grass and one goosefoot seed was found during the plant macrofossil analysis. The pollen record from washes of two pieces of groundstone suggests that a low-spine Compositae and grass were processed at the site as well.

Another excavated site in southwest Wyoming belonging to the Green River phase is Component I at 48CR3961 with a radiocarbon age of 5630 years ago (O'Brien et al. 1983). This component consists of a fire-cracked rock scatter with charcoal staining. Associated with the rock scatter are a large, side-notched knife; retouched flakes; a utilized flake; and groundstone implements. Bison bone was recovered as well. The pollen record suggests that mint and a member of the goosefoot family were processed in the area during the spring and early summer. Additional excavated sites dating to this period but providing only meager information include 48UT370 (Miller 1982; Schroedl 1985) and 48UT375 (Angulski 1982).

Overall, sites belonging to the Green River phase have housepits; firepits; other feature types; large, side- and corner-notched projectile points; large, side-notched knives; retouched flakes; and groundstone. Identified animal remains are dominated by small animals such as cottontail, jackrabbit, and ground squirrel. The occasional large mammals are mule deer and pronghorn with mule deer possibly more common. Bison is rare at these sites, present only at 48CR3961 (O'Brien et al. 1983). Also, the processing of plants probably was important as attested by the recovery of groundstone. Because most sites dating to this phase lack charred seeds, roots or greens probably were the favored food plants. According to the pollen record, these plants include goosefoot, beeweed, pricklypear, and mint.

As mentioned above, the assemblages from the Green River phase sites are similar to those belonging to the earlier Great Divide phase, though sites appear to be more common in southwest Wyoming during the Green River phase. In addition to southwest Wyoming, sites dating to the Early Archaic period occur throughout the Intermountain West; however, many of these have ages placing them in the earlier portion of the period. These sites include Pretty Creek (Loendorf et al. 1981), Mummy Cave (McCracken et al. 1978), Lookingbill (Frison 1983), Hogup Cave (Aikens 1970), and Sudden Shelter (Jennings et al. 1980).

Pine Spring Phase

The Pine Spring phase dates from about 4800-4300 to 3000 years ago and includes what is referred to on the Northwestern Plains as the McKean Complex (Frison 1978). Sites dating to this period on the Northwestern Plains usually contain distinctive projectile point types; McKean Lanceolate, Mallory, Duncan, and Hanna, which mark the McKean Complex. These sites on the Plains are often associated with bison hunting and trapping (Frison 1978). Because of the recovery of large quantities of grinding implements, the complex is thought to represent a fluorescence of the plant food gathering adaptation (Keyser 1986).

In southwest Wyoming, some sites, including Component II at the Taliaferro site, contain McKean Complex point types. Component II yielded points similar to the McKean Lanceolate and Duncan types; however, the deposits belonging to this component were the most disturbed and eroded for the site. Most of the cultural material was found in a disturbed context, and several of the McKean Complex points were recovered from later deposits. Unfortunately, the component lacked sufficient charcoal for radiocarbon estimates, but it was stratigraphically between Component I (5200 years ago) and Component III (2850 years ago). Two pit features that probably served as storage pits were part of the Component II assemblage. The plant macrofossil and pollen analyses of the fill from each feature produced negative results. Only 15 bone fragments were recovered.

Another site in southwest Wyoming with McKean Complex projectile point types is Occupation 2 at Pine Spring (Sharrock 1966). Though the layer with the points was dated at 3600 years ago, material from several assemblages and occupations were mixed in the layer. Component VII at the Deadman Wash site had similar point types with dates between 2800 and 2100 years ago (Armitage et al. 1982). Either the deposits at Deadman Wash were mixed, or these point types occur in southwest Wyoming much later in time than the surrounding regions. In the Northwestern Plains, sites with McKean Complex point types roughly date between 5000 and 3000 years ago (Frison 1978). McKean Lanceolate points from Sudden Shelter on the northern Colorado Plateau have an age ranging from 4600 to 3500 years ago (Holmer 1978), and Duncan points from Deluge Shelter in Dinosaur National Monument are approximately 4000 years old (Leach 1970). Throughout southwest Wyoming, these point types also appear in numerous surface collections (Zier et al. 1983).

Several excavated sites in southwest Wyoming dating to the Pine Spring phase lacked McKean Complex point types and instead had large, side- and corner-notched points. Components II and III at the Sweetwater Creek site dating to 4380 and 3710 years ago is one such site (Newberry and Harrison 1986). In addition to side- and corner-notched projectile points, the components produced a housepit, basin-shaped pits, and a slab-lined hearth. The features lacked charred plant macrofossils, but the pollen record indicates that goosefoot, beeweed, and pricklypear were processed in or near the features. Only two burned bone fragments of a small mammal were recovered from Component II.

Component II at 48SW2200 with an age of 4380 years ago also dates to the Pine Spring phase (Creasman et al. 1983). This component had side- and corner-notched projectile points, firepits, and a single groundstone fragment. The few animal remains from this component were identified to small mammal. The features lacked charred seeds, and the pollen record suggests that greasewood, grass, and pricklypear were used. Another site belonging to this phase in southwest Wyoming is Component I at 48SW1091 with an age of 3920 years ago (O'Brien 1982). Recovered cultural material includes a firepit, a corner-notched projectile point, and six pieces of groundstone. A single charred monolepis seed was found in the feature. Except for intrusive material, animal remains were absent from the component. Component II at the Cow Hollow Creek site with an age of 3455 years ago also belongs to the Pine Spring phase but lacks projectile points. Recovered faunal remains include rabbit and larger mammal, probably antelope or deer (Schock et al. 1982).

Overall, information concerning the Pine Spring phase in southwest Wyoming is meager, and the relationship of the McKean Complex to the prehistory of the area is unclear. McKean Complex point types are common throughout the area as surface finds or are often found in disturbed or mixed deposits, such as at the Taliaferro site. Instead, the several dated components belonging to this phase have only large, side- and corner-notched projectile points. Little subsistence information has been obtained from excavated sites in southwest Wyoming, but the scanty data indicates that small animals and plant foods other than seeds were important in the diet of the prehistoric inhabitants. Large game animals utilized were primarily antelope and deer. In contrast, bison was intensively exploited at sites in nearby areas, such as the Scoggin site located on the eastern edge of the Wyoming Basin (Lobdell 1973).

Deadman Wash Phase

According to Zier et al. (1983), the Deadman Wash phase dates between about 2800 and 1800 years ago. The designation of the phase was based primarily on evidence from the Deadman Wash site located east of Rock Springs. Component III at the Taliaferro site with radiocarbon ages of 2850, 2590, and 1910 years ago belongs to this phase. Six pit features were excavated, of which most appear to be firepits for heating rocks for use in boiling water. A major activity associated with the site during the Deadman Wash phase was the production of bone grease or juice from the hind quarters and distal extremities of mostly bison and pronghorn. Seeds also were processed, as attested by the recovery of a few charred goosefoot and a mustard family seed. Projectile points include corner-notched, side-notched, and bifurcate-stemmed types.

Another site located just south of the Taliaferro site in the Green River Basin belonging to this phase is Component II at 48SW1242 (Hoefer 1986). This component has a radiocarbon age of 2170 years ago and produced a basin-shaped pit; a large, corner-notched projectile point; and an indeterminate groundstone fragment. Identified animal remains are cottontail and jackrabbit. Component II at 48SW1091, dating to 2740 and 2070 years ago, also yielded corner-notched projectile points (O'Brien 1983). In addition to three features, large quantities of groundstone fragments were recovered; however, the features lacked charred seeds.

Component II at the Porter Hollow site located in the Green River Basin has radiocarbon dates of 2400 and 2200 years ago (Hoefer 1987). Nine small basin-shaped pits, which lacked charred seeds, were the excavated features. Other recovered cultural material includes corner- and side-notched projectile points. Similar to the Taliaferro site, the lower limbs of bison and pronghorn were the only identified bone recovered from the Porter Hollow site. Component III at the Maxon Ranch site, dating to 2250 and 2180 years ago, yielded bone from the lower limbs of bison and pronghorn, but the collection contains mule deer, jackrabbit, and cottontail bone as well (Harrell and McKern 1986). Six features were excavated, including slab-lined, rock-lined, rock-filled, and basin-shaped pits. Large, side-notched projectile points and a shaped mano are among the recovered artifacts. The component lacks charred plant macrofossil remains.

Materials dating to the Deadman Wash phase at the Deadman Wash site were recovered from Component VII with radiocarbon ages ranging from 2870 to 2140 years ago (Armitage et al. 1982). As mentioned under the Pine Spring phase, this component produced projectile points similar to those in the McKean Complex as well as side- and corner-notched varieties (Creasman 1984). Large quantities of groundstone also were recovered. Identified bone includes bison, pronghorn, mule deer, jackrabbit, and cottontail.

Overall, side- and corner-notched projectile point types occur at Deadman Wash phase sites in southwest Wyoming with corner-notched points being more common. Corner-notched points also characterize sites dating to this period in other areas of Wyoming, including Mummy Cave (McCracken et al. 1978) and Spring Creek Cave (Frison 1965). Bison and pronghorn appear to be the favored animals, though smaller animals were exploited at some sites. Except for the recovery of groundstone implements at a few sites, little information exists concerning the use of plant foods at Deadman Wash phase sites in southwest Wyoming. The only site producing charred seeds is the Taliaferro site.

Uinta Phase

After a transition period from about 1800 to 1500 years ago, the Uinta phase continues to about 1000 years ago. During this phase in southwest Wyoming, the number of sites increase, and small arrow points replace the larger dart points of the earlier phases. Components IV-VII at the Taliaferro site, dating from 1500 to 960 years ago, belong to this phase. From these components, over 70 small, corner-notched projectile points resembling the Rose Spring type were recovered. Features include a housepit, rock-filled pits, and basin-shaped pits of various sizes. Each of these components yielded large numbers of charred seeds representing up to 19 different taxa. Among the identified animal species from the recovered bone are bison, pronghorn, mule deer, jackrabbit, cottontail, muskrat, prairie dog, ground squirrel, sage grouse, and sucker. Bison remains are absent in the two components belonging to the middle portion of the Uinta phase, which indicates, perhaps, that bison was unavailable during this time. The Taliaferro site during the Uinta phase appears to have been a residential camp.

Several excavated Uinta phase sites in the Green River Basin represent more specialized activities, such as the communal processing of pronghorn. A pronghorn processing site in the Green River Basin is the Austin Wash site dating between 1370 and 1070 years ago (Schroedl 1985). The remains of 15 pronghorn were recovered as well as some bison, jackrabbit, cottontail, and coyote/dog. Features in the processing area included various pits, middens, and postholes. Goosefoot, strawberry, and peppergrass seeds were found during the plant macrofossil analysis. Among the flaked stone artifacts are 16 Rose Spring projectile points and 10 hafted knives. Hafted knives also were found at the Taliaferro site. The Oyster Ridge site is another site containing evidence of intensive use of pronghorn (Zier 1982). Artifacts from this site include Rose Spring projectile points and groundstone.

Among other excavated sites dating to the Uinta phase in southwest Wyoming is Component III at 48SW1242 with radiocarbon ages of 1550 and 1540 years ago (Hoefer 1986). This component contained 5 pit features, an extensive fire-cracked rock scatter, 8 Rose Spring projectile points, an olive shell bead, and 23 pieces of groundstone. The site provides some of the earliest dates for Rose Spring points in southwest Wyoming. Charred seeds recovered from the features are goosefoot, monolepis, and saltbush. Bison, mule deer, pronghorn, cottontail, owl, goose, and sage grouse are among the identified animals in the assemblage.

Component II at the Sheehan site is another excavated Uinta phase in southwest Wyoming (Bower et al. 1986). This site had three firepits and a midden, Rose Spring projectile points, bone awls, bone beads, groundstone, and ceramic sherds. These sherds are similar to Uinta Gray, a Fremont Gray ware that is common in the Uinta Basin, Utah. Fremont pottery is occasionally found at other sites dating to the Uinta phase in southwest Wyoming, such as the Pine Spring site (Sharrock 1966). The Sheehan site produced bone identified to elk, sheep, mule deer, pronghorn, porcupine, skunk, cottontail, and jackrabbit. Other excavated sites dating to this phase that have Rose Spring projectile points include Cow Hollow Creek (Schock et al. 1982), 48UT779 (Schroedl 1985), and Paradox Ridge (Gardner et al. 1982).

In contrast to the above mentioned sites, the Wardell Buffalo Trap located in the upper Green River Basin with dates ranging between 1580 and 990 years ago has small, side-notched projectile points instead of the Rose Spring corner-notched type (Frison 1973). Additionally, the site is unique in that it is a communal bison procurement area, which consisted of a kill and processing area. It is still unclear how this site with its quite different assemblages relates to other Uinta phase sites in the area. Another site containing similar side-notched projectile points is Component IV at the Maxon Ranch site with an age of 1140 years ago (Harrell and McKern 1986). This component produced 11 pit features, 3 side-notched projectile points, and groundstone implements. Identified species represented in the bone collection are pronghorn, jackrabbit, cottontail, ground squirrel, vole, and sage grouse.

Overall, the Uinta phase marks a major change in the prehistory of southwest Wyoming. By the beginning of this phase, there is a switch from darts to the bow and arrow, a greater reliance on seeds from weedy species, a focus on a wide variety of large and small animals, and an increase in the number of sites. Fremont influence also occurs in the area at this time, as attested by the occurrence of pottery sherds at some sites. The extent of this influence is unknown. During the Uinta phase, communal hunting and processing of pronghorn appears to have been an important activity. Bison kill and butchering sites also date to this phase, but it is unclear how they relate to the other known sites in the area.

Firehole Phase

The remaining prehistoric phase in the Zier et al. (1983) scheme is the Firehole phase which dates from about 1000-900 years ago to the protohistoric. This phase is distinguished from the Uinta phase by a decrease in radiocarbon dates, introduction of small, side-notched points resembling the Desert Side-notched type, and Intermountain Ware pottery. Component VIII at the Taliaferro site probably belongs to this phase. Though not radiocarbon dated, the component occurs stratigraphically above the Component VII (960 years ago) deposits and contains a point similar to the Desert Side-notched type.

Little information is available for this phase. Evidence for the continuation of communal pronghorn procurement comes from the Firehole Basin 11 site (Zier et al. 1983). This site is a pronghorn processing area that produced small, side-notched projectile points and ceramic sherds and dates to 645-625 years ago. The Eden-Farson site, with a radiocarbon age of 230 years ago, dates to the end of the Firehole phase or the beginning of the protohistoric period (Frison 1971). Remains of over 200 pronghorn were recovered from 12 lodges. The site also produced many small Desert Side-notched projectile points. Another site probably dating to this phase is Skull Point (McGuire 1977). Testing at the site yielded small, side-notched projectile points; a bone awl; Intermountain Ware pottery; and bison and pronghorn remains. In addition to these sites, several of the larger stratified sites in the area contained material from this phase mixed in the upper deposits.

SETTLEMENT AND SUBSISTENCE

As mentioned in Chapter 1, one of the research topics for the LaBarge project focuses on the refinement and development of a generalized model of prehistoric settlement and subsistence for the Middle Rocky Mountain province. One model proposed by Sanders et al. (1982) and discussed in the project treament plan (Creasman et al. (1985) incorporates a seasonal round where distinct geographic areas are used during different periods of the year. According to the model, the prehistoric people exploited the resources in the mountains in the summer, used the foothills during the fall and spring, and spent the winter in the lower basins. To learn more concerning the seasonal round of the prehistoric inhabitants of southwest Wyoming, evidence for the season of occupation at the Taliaferro site during the various components is examined. The types of activities represented also are summarized.

Data from the Taliaferro site provides clues about the type and season of activities at a large residential camp located in the center of the Green River Basin. The foothills of the Overthrust Belt are about 25 km west of the site, and the Green River is about 7 km to the east. The perennial Slate Creek, located next to the site, was a ready source of water for the prehistoric inhabitants.

The Early Archaic Component I dates to 5200 years ago, and information about subsistence and season of occupation is meager. Pricklypear pollen from the two features indicates that the fruits or stems from this taxon were processed in the vicinity of the two hearths. Pricklypear fruits are ripe in the late summer, suggesting an occupation at this time of year. A single charred sedge seed also was found from one of the features. Sedge is part of the riparian community along Slate Creek, and its seeds are available in the late summer as well. The one bone fragment of a large mammal from this component provides little subsistence information. The Taliaferro site during

Component I times appears to have been a short-term residential encampment where several family units camped in the late summer. One activity represented is the production and maintenance of flaked stone implements.

Because the Middle Archaic Component II deposits were disturbed due to erosion, little information exists concerning type of activities and season of use for this period at the site. Fifteen long bone fragments of large and small mammals and mussel shells were the only recovered debris suggesting subsistence. Freshwater mussels are accessible for collection from spring to fall, which indicates a possible occupation during all seasons except winter. Late spring and early summer runnoff, however, raises the river to heights that may have made the colletion of freshwater mussels very difficult if not impossible during these times.

The Late Archaic Component III has radiocarbon ages of 2850, 2590, and 1910 years ago. Three of the six features belonging to Component III yielded charred goosefoot and mustard family seeds, which indicates that seeds of these taxa were processed at the site during the late summer and fall. The pollen evidence from the features supports this interpretation. Liliaceae family pollen from a piece of groundstone suggests that roots or bulbs of a lily were ground at the site. Onion and sego lily bulbs are available during the early part of the summer. Bison and pronghorn are the identified taxa represented in the bone collection from the component. Apparently, selected portions of the body of these species, especially the hind quarters and distal extremities, were brought to the site for meat as well as for bone grease or juice production. Because only a few bones and seeds were recovered, the cooking of food plants and the production of bone grease or juice at the site were probably for immediate consumption during daily meals. Evidence of specialized activities for obtaining resources for future needs is lacking; however, one of the features may have functioned as a storage pit.

The nine excavated features from the Late Prehistoric Component IV dating to 1500 years ago produced 1910 charred seeds representing 14 taxa with goosefoot dominating the collection. Seeds from the identified taxa are available in the late summer and fall. A major activity occurring during Component IV times at the site was the processing of these seeds for winter stores. Among the identified animal remains are bison, pronghorn, jackrabbit, cottontail, muskrat, ground squirrel, vole, sage grouse, sucker, and freshwater mussel. A wide range of habitats was exploited for these animals. The small animals probably were roasted in oven pits, and the large animals were used for meat and the bone processed for juice and grease.

The Late Prehistoric Component V dates to 1310 years ago. As with the other Late Prehistoric components, Component V features contained charred seeds of weedy plants, which indicates that the processing of these seeds in the late summer and fall for winter stores was an important activity. Charred seeds and pollen of taxa such as Liliaceae occurred in some features. Species in the lily family bloom in the spring and early summer, suggesting an occupation for the site as early as June. Mule deer, pronghorn, jackrabbit, cottontail, and sage grouse are the identified taxa from the recovered animal remains. One of the identified animals was a fetal pronghorn. The peak birthing season of pronghorn is the first week of June. The presence of egg shell suggests an occupation for the site as early as April or May. Apparently the site during Component V times was occupied in spring and in the late summer and early fall.

The Late Prehistoric Component VI, dating to 1170 years ago, contained a large, stratified basin that was probably covered with a shelter or windbreak. Within this sheltered area, the processing of seeds of such taxa as goosefoot, beeweed, and mustard family was a major activity. The seeds probably were collected and processed during the late summer and fall for winter stores. Liliaceae pollen occurred on a metate fragment indicating that roots or bulbs of a lily such as onion or sego lily were ground at the site. Lily bulbs are availabe during the early part of the summer. Among the varied animals represented in the collection are mule deer, pronghorn, jackrabbit, cottontail, muskrat, prairie dog, ground squirrel, sage grouse, sucker, and mussel. Again, a wide range of habitats was exploited for these animals. Only selected portions of the large mammals were brought back to the residential camp and processed for meat as well as for bone grease or juice. Egg shell also was recovered, indicating an April or May occupation. The site may have been inhabitated both in the spring and late summer to early fall during Component VI times.

Seeds of weedy species that would have been available in the late summer and fall also were recovered from features belonging to the Late Prehistoric Component VII dating to 960. Charred seeds and pollen identified to the liliaceae family were part of the assemblage as well. Taxa in the lily family bloom in the early part of the summer. Identified animal remains include bison, mule deer, pronghorn, jackrabbit, cottontail, and mussel. The remains of fetal pronghorn are part of the collection, indicating the site was occupied between early May to late June. Apparently the site was used throughout the summer, but the most active times of use were during the late spring and late summer/early fall. Component VIII lacked information concerning season of occupation.

From the above evidence it appears that the Taliaferro site was primarily inhabited during two distinct seasons the spring and late summer to early fall. However, there are indications of occasional use throughout the summer. This pattern of site use within the Green River Basin contrasts with the seasonal round model proposed by Sanders et al. (1982) which hypothesizes that the basins were used in the winter. Sanders et al. (1982) also states that water would be scarce in the basin in the summer, thereby discouraging use during those months. At a locality such as the Taliaferro site, however, water would have been available throughout the year from the perennial Slate Creek. Other excavated sites in the basins of southwest Wyoming that appear to have been occupied in the later part of the summer include 48SW1242 located in the Green River Basin a few kilometers south of the Taliaferro site (Hoefer 1986) and the Buffalo Hump site located in the Great Divide Basin (Harrell 1987). Like Component VI at the Taliaferro site, the Buffalo Hump site also had structures where the processing of seeds for winter stores was a major activity.

Apparently the prehistoric hunters and gatherers of southwest Wyoming, at least during the Late Prehistoric period, formed residential camps in the basins during the period from late spring into the early fall. One of the major activities associated with late summer/early fall use was the procurement of seeds for the winter. The prehistoric peoples may have created disturbed areas and encouraged weedy annuals at localities near these camps. The encouragement of certain plants would have provided a known food resource that could be returned to year after year. The basins of southwest Wyoming were also used in the late summer or fall for the communal killing and processing of pronghorn as evidenced by such sites as the Austin Wash site (Schroedl 1985) and the communal killing and processing of bison (Frison 1973).

The hunters and gatherers who camped at the Taliaferro site probably were in part what Binford (1980) describes as foragers. According to Binford

(1980), foragers move their base camps to the desired resource. During the late spring and summer months, the prehistoric camps in the basins of southwest Wyoming probably were moved to areas with water and large patches of exploitable plant resources. These residential camps would be relocated frequently as resources become depleated. Relocations most assuredly took the prehistoric people out of the basins and into the mountains to the west.

Because seeds and pronghorn were obtained and stored for winter use, the prehistoric inhabitants were also what Binford (1980) refers to as collectors. The residential camps created or established during the late summer and early fall at the Taliaferro site were utilized somewhat differently from those established during early months. Specialized task groups probably went from the residential camp to other localities to extract and/or minimally process specific resources that would be transported to the residential camp or cached for later use. In relation to the Taliaferro site, these resource extraction camps may have been created to target additional seed patches, procure aquatic resources, and procure antelope.

Most likely the prehistoric people occupied the foothills above the basins in the winter. This elevated area is more protected from the intense winter weather than the open basins. Evidence for winter use of the foothills comes from the Maxon Ranch site (Harrell and McKern 1986). The Maxon Ranch site is located in the foothills below the Uinta Mountains and above the Green River Basin and yielded some data suggesting the use of stored foods during the winter or spring. During ethnographic times, the Indian groups of the Great Basin camped for the winter in the foothills above the valleys. The valleys were exploited in the summer (Steward 1938).

CHAPTER 6

MANAGEMENT SUMMARY

PROJECT SUMMARY

The Taliaferro site is one of three significant archaeological sites excavated by Archaeological Services of Western Wyoming College located along the Exxon Company, USA, LaBarge Natural Gas Project natural gas feed pipeline. The data recovery program was initiated to mitigate the adverse effects resulting from construction of the pipeline and associated staging area as required by federal regulations concerning cultural resources. Additionally, the investigations were planned to incorporate the area to be directly affected by the placement of a second pipeline within the same right-of-way for the Phase II portion of the LaBarge Project. The project was conducted in accordance with the Memorandum of Agreement between the Wyoming Bureau of Land Management (BLM), Bridger-Teton National Forest, Wyoming State Historic Preservation Office, and the Advisory Council on Historic Preservation (Creasman et al. 1985).

A total of 300 m^2 was excavated in two block areas, which yielded the remains of eight components. These components, separated horizontally and vertically, date between 5290 and 960 years ago. The analyses of the recovered features and other cultural debris provide information on the types of past activities conducted at a residential camp located in the Green River Basin. For most of its prehistory, the Taliaferro site appears to have been utilized at least during the late spring and late summer/early fall and possibly throughout the summer. As evidenced by the thousands of charred seeds recovered from the fill of many features, a major late summer/early fall activity at the camp (at least during the Late Prehistoric period) was the processing of seeds for winter stores. Portions of animals were brought back to the site for meat as well as for bone grease and juice production during most of the time periods represented. The recovery of huge quantities of debitage, projectile points, and other tools indicates the production of flaked stone implements was another important activity. Information concerning the use patterns and activities that took place at the Taliaferro site was obtained from the examination of the spatial relationships of cultural remains and analogies from ethnoarchaeological studies of modern hunters and gatherers.

Because the Taliaferro site contains eight components dating between 5290 and 960 years ago, it provides data about changes in the cultural remains through time. Many of the morphological projectile point types from the Taliaferro site are limited to distinct chronological periods, thereby providing temporal markers for southwest Wyoming. The various preform types, the notched knives, and the Type I distal retouched flakes (hafted scrapers) also tend to mark certain periods in the prehistory of the site. The raw materials favored for the manufacture of stone tools changed through time as did the overall size of the various bifaces. The evidence from the plant macrofossil analysis indicates that there was a marked change from generalized plant gathering to the use of seeds from weedy species in the subsistence base of the prehistoric inhabitants. The intensification of seed use was well established by the Late Prehistoric period. The type of animals exploited also changed through time.

The results of these investigations show that significant information can be obtained from large block excavations. Large block excavations provide the opportunity to examine the spatial relationships between the facilities (features) and other cultural debris, which facilitates the delineation of the various activities carried out by the prehistoric inhabitants at a site. Understanding the diversity of the activities at a site will help answer questions of a more regional nature, such as the subsistence and settlement strategies of the prehistoric inhabitants.

RECOMMENDATIONS

Because significant archaeological remains occur in intact buried deposits at the Taliaferro site (48LN1468) the site has been evaluated as eligible for nomination to the National Register of Historic Places. Analyses of the cultural material recovered during the excavations have contributed new information and interpretations about the prehistoric lifeways of the hunters and gatherers in southwest Wyoming during the past 5000 years. The data recovery program at the Taliaferro site has produced significant results and serves to mitigate the adverse impacts resulting from the construction of the Exxon Company, USA, LaBarge Natural Gas Project gas pipeline (Phase I), associated staging area, and future Phase II pipeline.

If additional ground disturbing activities are planned (other than the Plase II pipeline) in the area encompassing the Taliaferro site, it is recommended that a cultural resource data recovery program be implemented prior to construction. Investigations should include extensive block excavations to further explore the types of past activities that took place at the site. Additional excavations at the site could provide valuable information about changes in the lifeways of the prehistoric inhabitants during the past 5000 years at a residential camp in the Green River Basin.

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APPENDIX A

FEATURE ANALYSIS

By C. S. Smith

Thirty-two pit features, five fire-cracked rock concentrations, and a large midden area were encountered during excavations at the Taliaferro site. Pit features were found throughout the excavation blocks and in every component except Component VIII. However, the majority of these features belong to the Late Prehistoric components and occur in Excavation Area B. Most of the fire-cracked rock concentrations were associated with small pit features. In addition to these concentrations, fire-cracked rocks were scattered across the excavation areas in most components. The large midden area dates to the Late Prehistoric Component VI and formed in a natural swale that crosses the center of Excavation Area A. Figures 1 and 2 show the location of the features from all components within the excavation blocks. Morphological descriptions are presented first and then the functions of the features are interpreted using information such as the content of fill and associated artifacts and debris.

MORPHOLOGICAL DESCRIPTIONS

The morphological characteristics of the pit features, the fire-cracked rock concentrations, and the midden area are described below. Associations with components and other features are also provided in these descriptions. In Component IV of Excavation Area B, two groups of pit features which consisted of at least one oxidized, large, and small basin were uncovered. These groups will be referred to as multiple feature groups. Additionally, two feature groups were present in Component III of Area A. Each of these contained a rock-filled basin just below and overlapping an irregular-shaped pit. A fire-cracked rock concentration was found next to one of the irregular-shaped pits and rock-filled basin groups.

Pit Features

The 32 pit features uncovered at the Taliaferro site were classified into eight morphological types. Their attributes, including dimensions, area, volume, and shape, are listed in Table 1. The volume and area for the features were calculated using the formulas detailed in Chapter 3. The numbers designating the pit features were assigned in the field during excavation. Unused numbers in this analysis were initially applied to stains which upon further investigations turned out not to be features. The features were first grouped into irregular-, basin-, and bell-shaped pits using plan view and cross section characteristics. The basin-shaped features were further subdivided by the presence or absence of fire-cracked rocks. Those lacking rocks were divided into large, medium, and small basins using volume and surface area data. Two basins, Features 6 and 15, which contained oxidized sides, were considered in separate groups. Feature 30, a unique, large, stratified basin (probably a structure) was assigned to its own category. The surface area to volume was plotted for each feature to facilitate classification (Figure 3).

Irregular-Shaped Pits

Five irregular-shaped pits were uncovered: four were in Excavation Area B and two occurred in Excavation Area A. These include Features 1, 2, 4, 24, 27, 35, and 36. These pits were characterized by an irregular plan view, a shallow cross section, and oxidation on the bottom (Figure 4 and Chapter 4,

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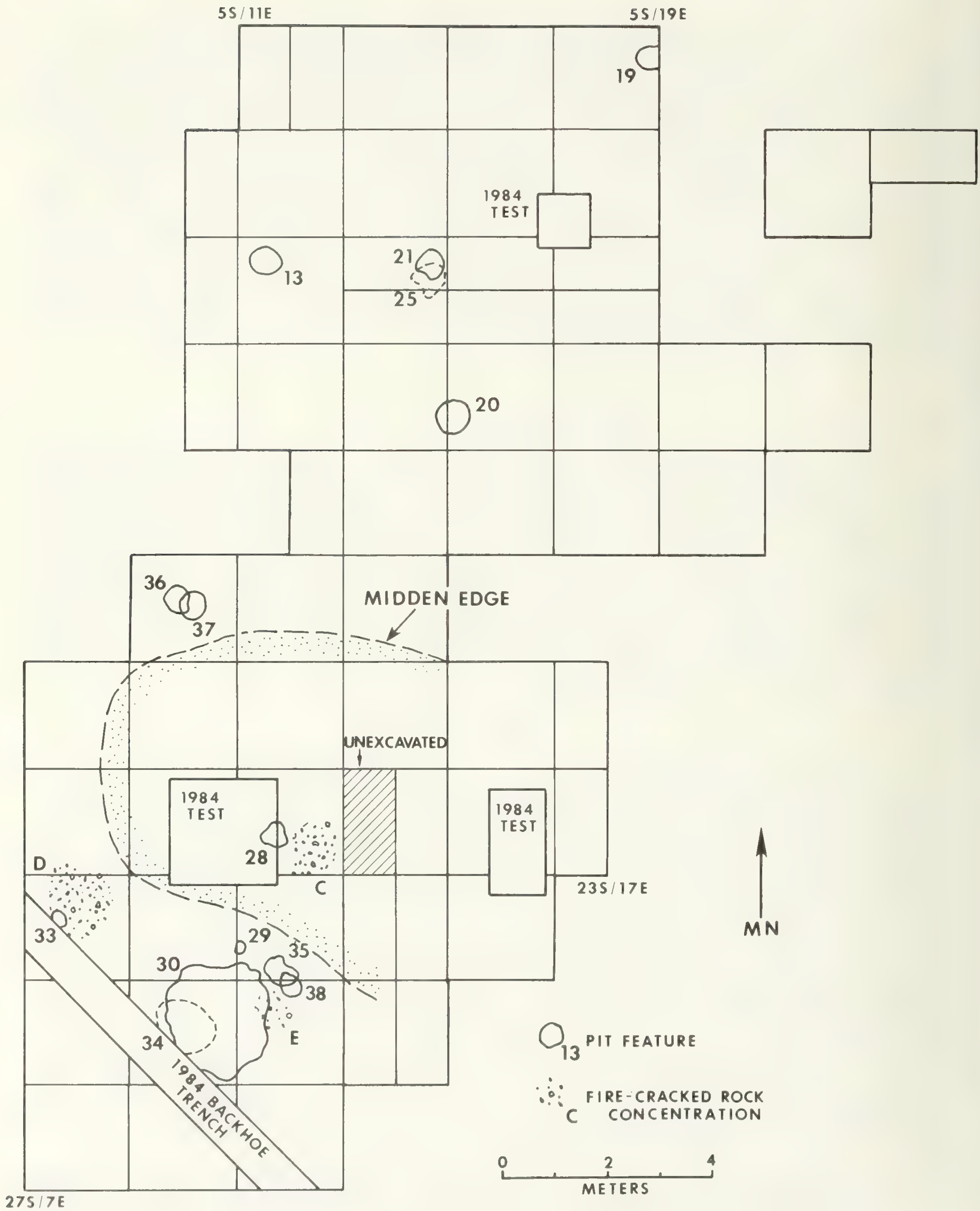


Figure 1. Plan map of Excavation Area A showing location of features for all components, Taliaferro site.

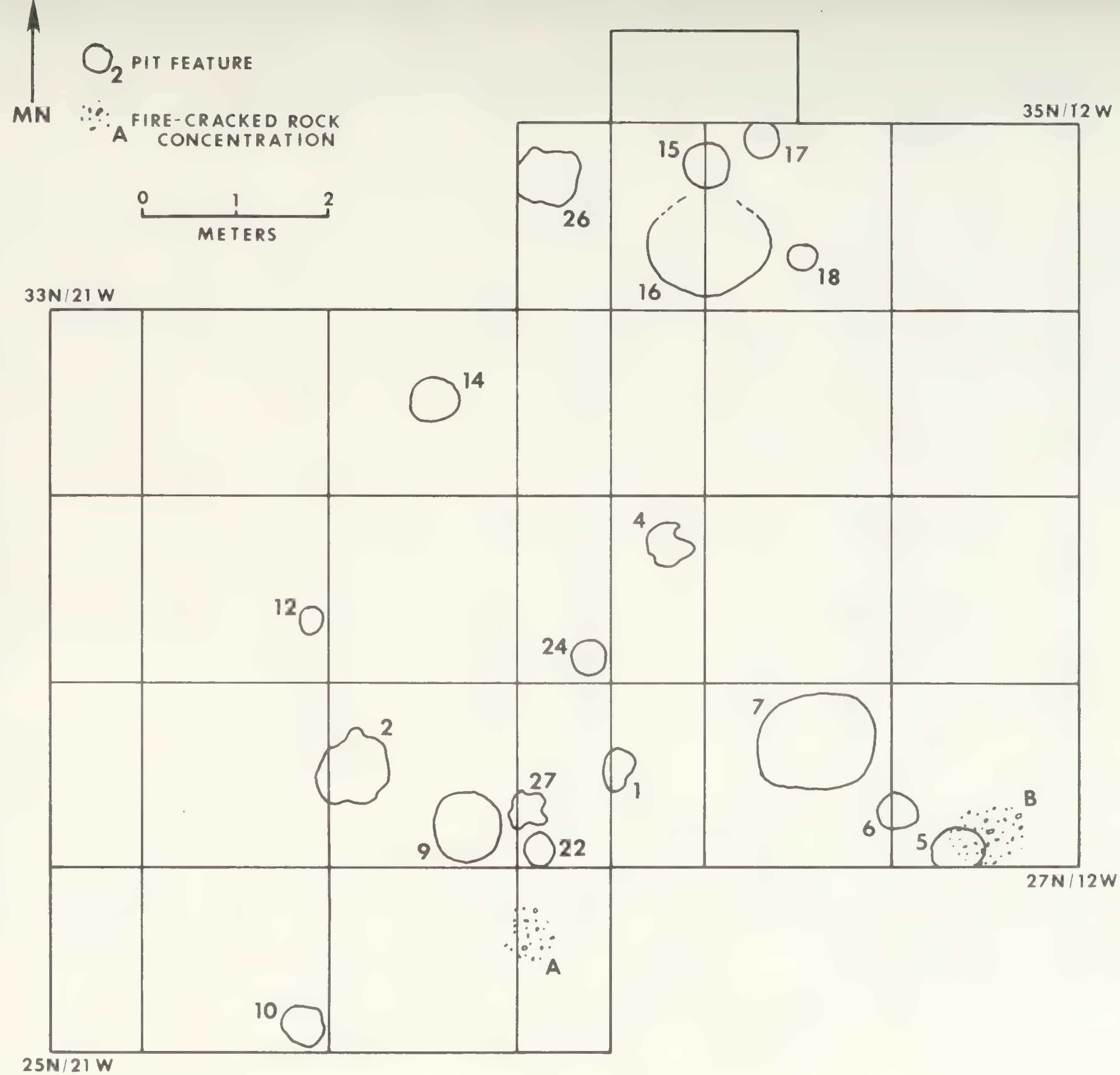


Figure 2. Plan map of Excavation Area B showing location of features for all components, Taliaferro site.

Table 1. Characteristics of pit features, Taliaferro site.

Feature No.	Type	Excavation Area	Component	Dimensions (cm) L	W	D	Volume (liter)	Area (cm^2)	Rocks No.	wt (kg)	Oxidation	Shape Plan View	Cross Section	Associations	Radiocarbon age (years B.P.)
1	Irregular-shaped	B	VII	55	50	8	11.5	1963.5	-	-	Bottom	Irregular	Basin	-	-
2	Irregular-shaped	B	VII	85	74	8	26.0	5026.5	-	-	Bottom	Irregular	Basin	-	-
4	Irregular-shaped	B	V	50	40	8	8.0	1590.0	-	-	Bottom	Irregular	Basin	-	-
5	Small basin	B	IV	60	40	6	7.5	1963.0	-	-	-	Circular	Basin	F.6, 7	-
6	Oxidized basin	B	IV	45	39	7	6.5	1385.0	-	-	Sides	Circular	Basin	F.5, 7	-
7	Large basin	B	IV	120	87	7	38.0	8413.0	-	-	Bottom	Circular	Basin	F.5, 6	-
9	Bell-shaped	B	V	70	70	20	51.0	3848.0	-	-	-	Circular	Bell	-	-
10	Small basin	B	V	47	43	8	8.5	1590.0	-	-	-	Circular	Basin	-	-
12	Bell-shaped	B	V	28	25	17	6.0	551.5	-	-	-	Circular	Bell	-	-
13	Medium basin	A	II	55	45	24	31.0	1963.0	-	-	-	Circular	Basin	-	-
14	Rock-filled basin	B	V	45	43	17	17.0	1520.5	69	10.23	Sides	Circular	Basin	-	1310 ± 70
15	Oxidized basin	B	IV	46	45	20	21.5	1626.0	-	-	Sides	Circular	Basin	F.16, 17, 18	-
16	Large basin	B	IV	120	96	20	120.5	9161.0	-	-	-	Circular	Basin	F.15, 17, 18	-
17	Medium basin	B	IV	41	40	22	19.0	1288.0	-	-	-	Circular	Basin	F.15, 16, 18	1500 ± 70
18	Small basin	B	IV	30	28	9	4.0	660.5	-	-	-	Circular	Basin	F.15, 16, 17	-
19	Small basin	A	I	42	34	11	8.0	1134.0	-	-	-	Irregular	Basin	-	-
20	Medium basin	A	III	77	61	13	32.0	3739.0	-	-	-	Circular	Basin	-	1910 ± 110
21	Medium basin	A	II	54	50	24	34.0	2123.0	-	-	-	Circular	Basin	-	5290 ± 190*
22	Rock-filled basin	B	VII	40	40	13	11.0	1256.5	6	1.10	-	Circular	Basin	-	960 ± 60
24	Irregular-shaped	B	V	34	33	5	3.0	881.5	-	-	Bottom	Irregular	Basin	-	-

Table 1. Concluded.

Feature No.	Type	Excavation Area	Component	Dimensions (cm) L	W	D	Volume (liter)	Area (cm^2)	Rocks No.	wt (kg)	Oxidation	Shape Plan View	Cross Section	Associations	Radiocarbon age (years B.P.)
25	Small basin	A	I	58	40	6	7.0	1886.0	-	-	-	Irregular	Basin	-	5290 ± 190*
26	Medium basin	B	IV	75	60	11	26.0	3578.5	-	-	-	Circular	Basin	-	-
27	Irregular-shaped	B	IV	37	33	5	3.0	962.0	-	-	Bottom	Irregular	Basin	-	-
28	Rock-filled basin	A	III	45	42	10	10.0	1486.0	24	?	-	Circular	Basin	-	2590 ± 90
29	Small basin	A	VI	23	20	5	1.0	363.0	-	-	-	Irregular	Basin	-	-
30	Stratified basin	A	VI	215	195	29	571.0	31,416.0	-	-	-	Circular	Basin	-	1170 ± 60
33	Small basin	A	VI	20	15	7	1.0	240.0	-	-	-	Irregular	Basin	-	-
34	Large basin	A	VI	104	75	8	32.5	6291.0	-	-	-	Circular	Basin	-	-
35	Irregular-shaped	A	III	40	35	3	2.0	1104.5	-	-	Bottom	Irregular	Basin	F.38	-
36	Irregular-shaped	A	III	40	20	9	3.5	707.0	-	-	Bottom	Irregular	Basin	F.37	-
37	Rock-filled basin	A	III	50	50	11	14.0	1963.5	20	3.6	-	Circular	Basin	F.36	-
38	Rock-filled basin	A	III	45	35	10	8.0	1256.5	15	2.1	Sides	Circular	Basin	F.35	2850 ± 90

Key: L = length
W = width
D = depth
* = same carbon sample

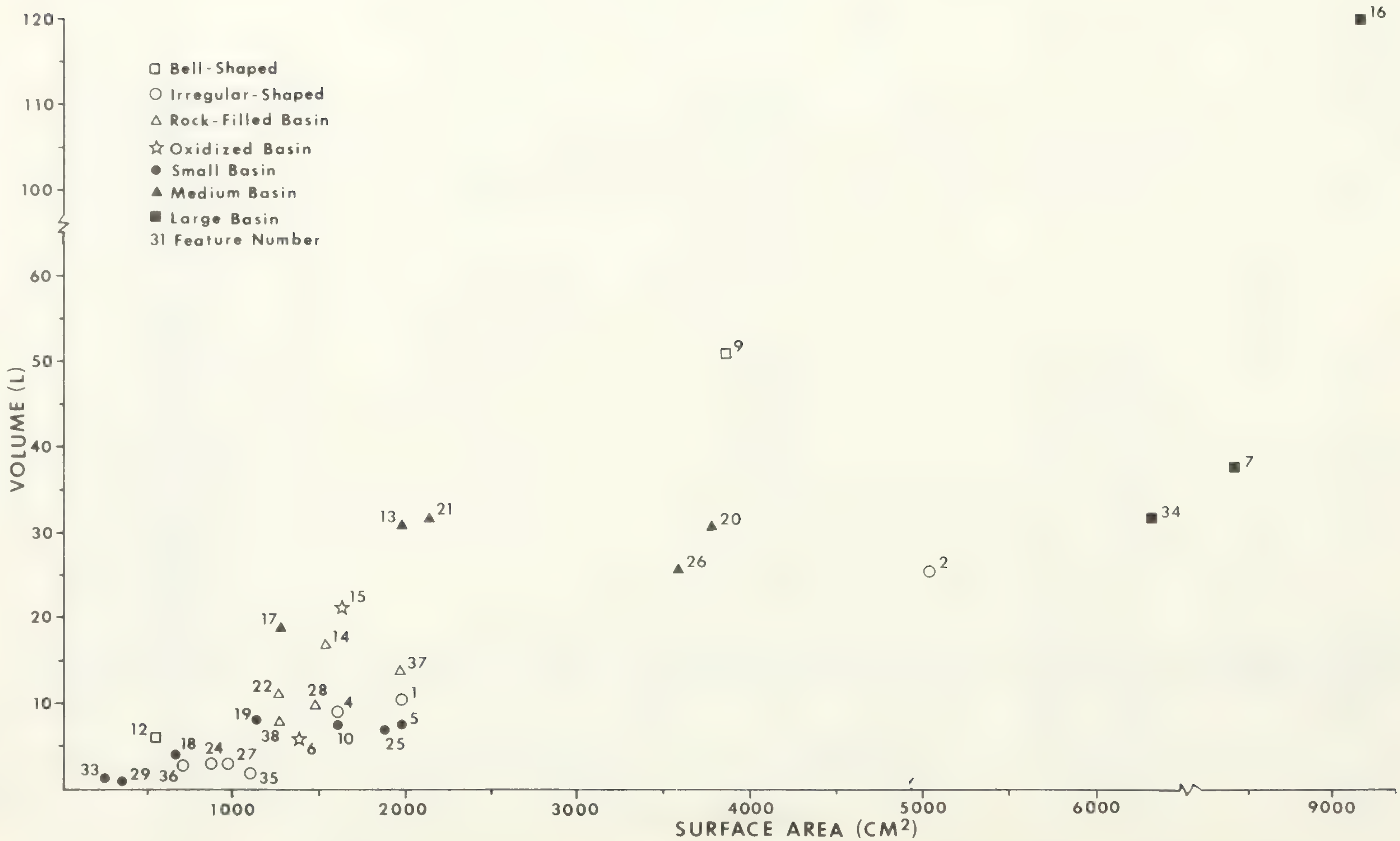


Figure 3. Plot of surface area to volume of pit features, Taliaferro site. The stratified basin, Feature 30, is not included.

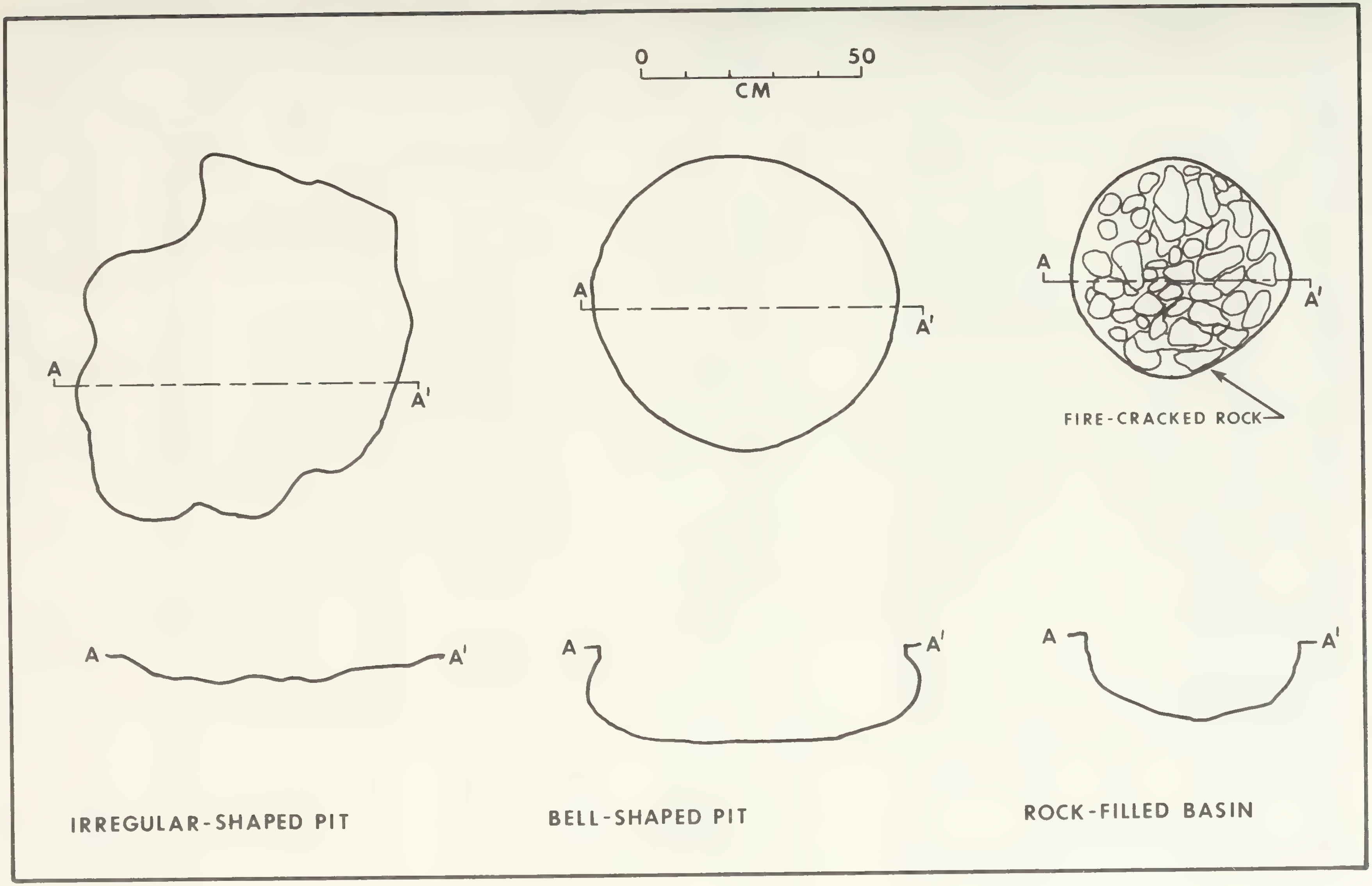


Figure 4. Plan view and cross section of an irregular-shaped pit, Feature 2; a bell-shaped pit, Feature 9; and a rock-filled basin, Feature 14, Taliaferro site.

Figures 32 and 61). Except for Feature 2, these pits had a fairly small volume and surface area (Figure 3), and all were the remains of indistinct, ephemeral pits.

Two of the pits from Excavation Area B, Features 1 and 2, were in Component VII and were situated within 4 m^2. Features 4 and 24, also from Area B, were associated with Component V. Features 35 and 36 were found within Area A and within Component III. Both were shallow oxidized areas with charcoal that occurred just above and to the side of rock-filled pits (Features 36 and 38; Chapter 4, Figure 32). The two irregular-shaped pits partly overlapped with the associated rock-filled basins.

Bell-Shaped Pits

Two bell-shaped pits, Features 9 and 12, were recorded in Excavation Area B. They were circular in plan view and had concave sides and a rounded bottom (Chapter 4, Figure 50). The diameter at the top of the features were smaller than in the middle. Both belonged to Component V and were about 2 m apart. As can be seen in Figure 3, volume and surface area of the two pits were quite different; Feature 12 was fairly small and Feature 9 was relatively large. An example of the cross section and plan view of this feature type is shown in Figure 4.

Basin-Shaped Pits

Based on the outline of the plan view and cross section, the remaining pit features were grouped into the basin-shaped pit catagory. This feature type was further divided into rock-filled, oxidized, stratified, large, medium, and small basins. The criteria used in the classification include the presence or absence of fire-cracked rocks or oxidation and the surface area and volume of the pits.

Rock-Filled Basins

Five basins containing fire-cracked quartzite cobbles were classified as rock-filled basins (Chapter 4, Figures 33, 34, and 51). They are Features 14, 22, 28, 37, and 38. Two were in Excavation Area B, and the others were in Area A. The rocks in these features lacked discernible patterns and were generally scattered throughout the fill. All five basins had roughly similar volumes and surface areas (Figure 3). An example of one of these is shown in Figure 4.

Feature 14, located in Excavation Area B with a radiocarbon age of 1310 years ago (Component V), was completely filled with 69 cobbles and exhibited oxidation along its sides. The other rock-filled basin in Excavation Area B dates to Component VII with a radiocarbon estimation of 960 years B.P. This basin had only six fire-cracked rocks. The three pits in Area A belong to Component III with radiocarbon ages of 2850 and 2590 years B.P. Feature 28, which was discovered during the 1984 testing of the site (Hoefer et al. 1985), was associated with Fire-cracked Rock Concentration C. Features 37 and 38 were each just below and to the side of an oxidized, irregular-shaped pit (Features 35 and 36). Additionally, Fire-Cracked Rock Concentration E was next to Feature 38, which also had oxidized sides.

Oxidized Basins

Features 6 and 15 were two basin-shaped pits that contained oxidation along their sides but lacked fire-cracked rocks. Both were recorded in Excavation Area B, Component IV, and had similar shapes and cross sections as medium and small basin features (Chapter 4, Figure 42). They were each associated with one of the two groups of basin-shaped pits referred to as multiple feature groups. Both of these multiple feature groups consist of at least a large, a small, and an oxidized basin within a 4 m^2 area. Feature 6 was situated between a large basin (Feature 7) and a small basin (Feature 5). Fire-Cracked Rock Concentration B was also associated with these pit features. The other oxidized basin, Feature 15, was next to a large basin (Feature 16), a small basin (Feature 18), and a medium basin (Feature 17) that produced a radiocarbon estimation of 1500 years B.P.

Stratified Basin

This unique basin, Feature 30, was by far the largest and measured 215 x 195 x 29 cm. It was roughly circular in plan view, basin-shaped in cross section, and was stratified with two types of fill (Figure 5; Chapter 4, Figures 58 and 59). The upper portion of the fill consisted of a dark stain containing charcoal, and the lower part was a lighter, mottled stain. The floor and sides of the basin were distinct except for the eastern downslope side, which was poorly defined. This feature was in the south half of Excavation Area A in Component VI with a radiocarbon age of 1170 years ago.

Large Basins

Three basin-shaped pits, Features 7, 16, and 34, were classified as large basins. Excluding the stratified basin, they had a much greater surface area and volume than the other basins (Figure 3; Chapter 4, Figures 41 and 42). All were over a meter in length but were relatively shallow: two were only 7 or 8 cm deep (Figure 6). Features 7 and 16 were each part of one of the multiple feature groups. Both features had well defined sides and bottoms except for the northern edge of Feature 16 which overlapped with Feature 15, an oxidized basin. Feature 34 occurred in the south half of Excavation Area A in the lower occupation layer of Component VI below Feature 30 and was without associated pits.

Medium Basins

The medium category includes the basin-shaped pits Features 13, 17, 20, 21, and 26 that were relatively deep compared to their surface area. On the surface area to volume plot, they fall between the small and large types (Figure 3). A typical example of their plan view and cross section is shown in Figure 6 (see Chapter 4, Figures 28 and 41).

Of the five medium basins, Features 13 and 21 were found in Component II within 4 m^2. Feature 20, which belongs to Component III, was radiocarbon estimated at 1910 years ago. Features 17 and 26 occurred in Component IV of Area B and were only 2 m apart. Feature 17 was associated with one of the multiple feature groups which contained a large basin, a small basin, and an oxidized basin. It has a radiocarbon age of 1500 years B.P.

Small Basins

Features 5, 10, 18, 19, 25, 29, and 33 were classified as small basins because of small volume and the absence of fire-cracked rocks or oxidation (Figure 3). The smallest pits, Features 29 and 33, had a volume of only 1.0 liter and the largest, Feature 19, had 8.0 liters of fill. They generally had circular plan views and basin-shaped cross sections (Figure 6; Chapter 4, Figures 20 and 21). However, several had irregular plan views because of deflation.

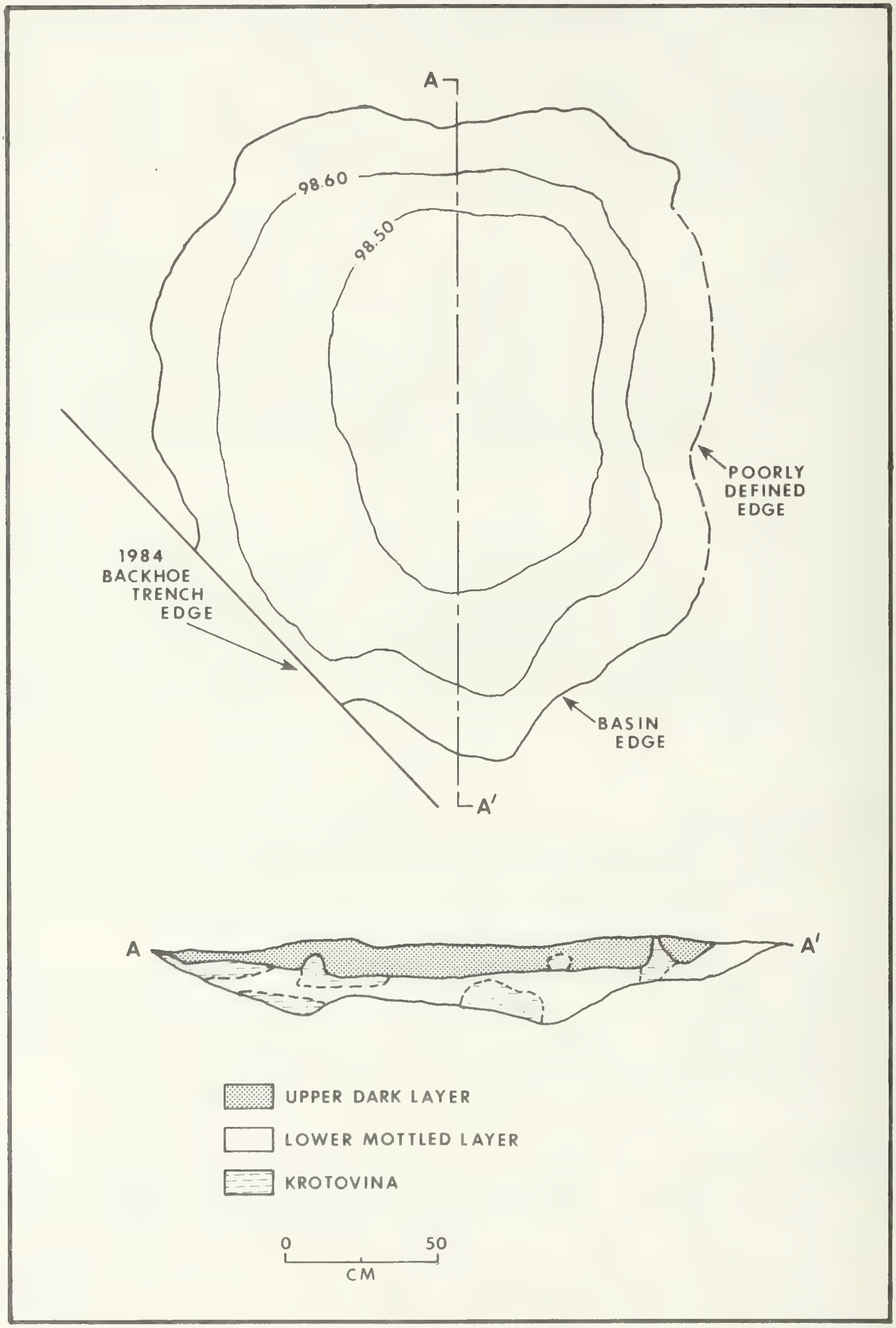


Figure 5. Plan view and cross section of the stratified basin, Feature 30, Taliaferro site.

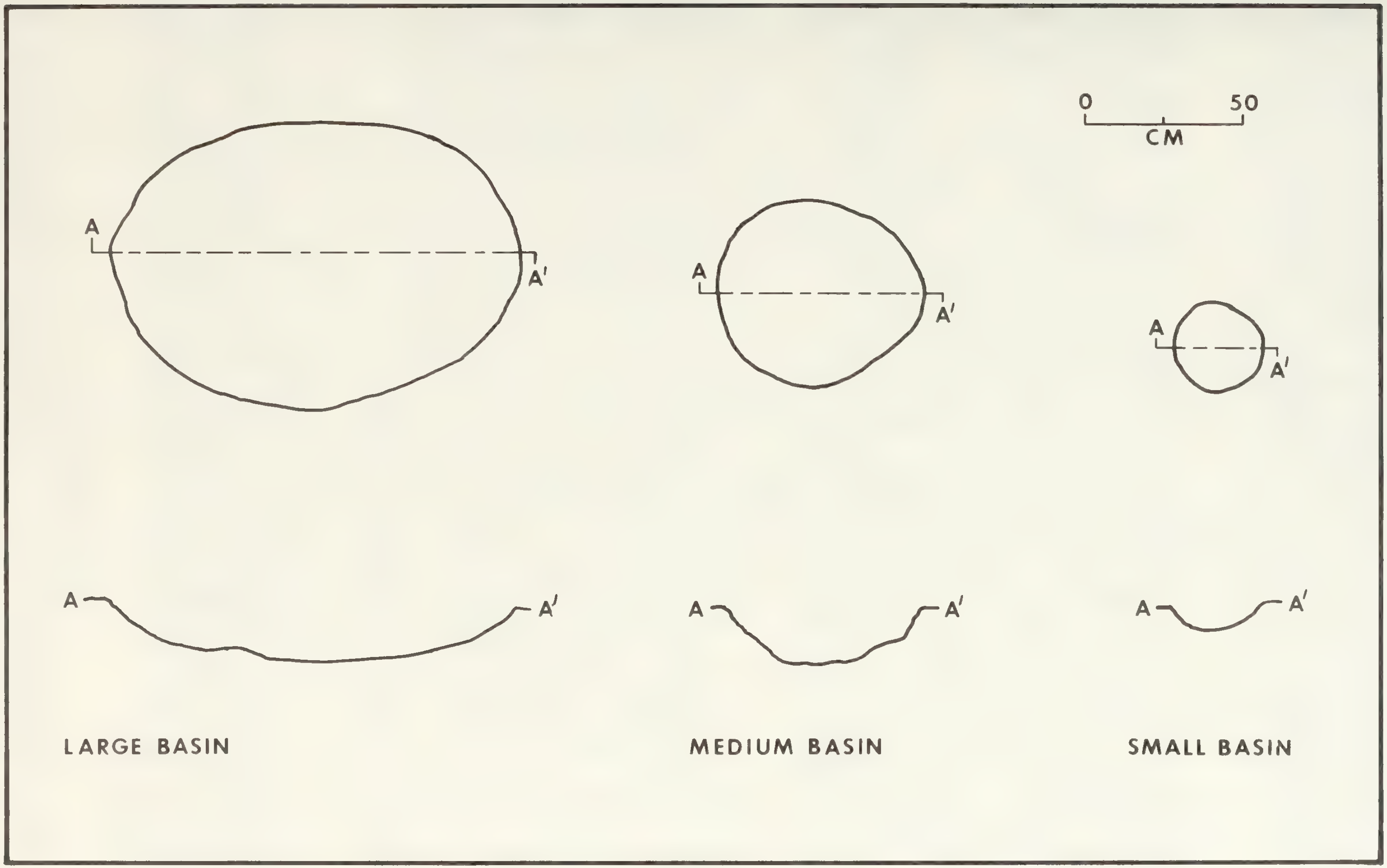


Figure 6. Plan view and cross section of a large basin, Feature 16; a medium basin, Feature 20; and a small basin, Feature 18, Taliaferro site.

These features were recorded in Excavation Areas A and B and were located in Components I, IV, V, and VI. Two, Features 5 and 33, were within fire-cracked rock concentrations, and Features 19 and 25 were deflated pits associated with Component I. Features 5 and 18 were each part of one of the multiple feature groups. They were in Excavation Area B, Component IV.

Fire-Cracked Rock Concentrations

Five concentrations of fire-cracked rocks were recorded; three were in Excavation Area A and two were in Area B (Table 2). Except for a few tabular pieces of sandstone, most of the rocks were quartzite cobbles. The boundaries between these concentrations and the scatter of rock that continued throughout many of the components were often arbitrary (Chapter 3, Figure 8). Several other areas within the scatters could have been considered concentrations, but only those associated with other features were delineated as such. The five concentrations, except for Fire-Cracked Rock Concentration A, were located in the vicinity of a pit feature. Concentration A was an isolated area of rocks which was designated as Feature 23 during the excavations.

Two of the concentrations were next to rock-filled basins, Features 28 and 38. Both were in the south half of Excavation Area A and belonged to Component III. The other two were associated with small basins, Features 5 and 33. Fire-Cracked Rock Concentration B and Feature 5 were part of a multiple feature group belonging to Component IV.

Large Midden Area

A large midden area in the Late Prehistoric Component VI was delineated in the south half of Excavation Area A. It measured approximately 8 x 6 m and consisted of a dark stained sand containing charcoal and other cultural debris such as fire-cracked rock, flakes, and bone. Except on the eastern downslope side, the midden was distinct from the lower, lighter deposits. On the eastern side, the midden gradually became thinner until it was mixed with other occupational material on the slope. In the center, the midden was over 50 cm thick, but it sloped steeply up to the edges. The midden appears to have formed in a natural swale which crossed the center of the excavation area. Around its edges, especially on the southern side, several areas of oxidation were present. In addition to this midden area, much of the deposits in Excavation Area B could be considered a midden as they were also stained dark and contained a high percentage of charcoal.

FUNCTIONAL INTERPRETATIONS

The pit features were typed and described in purely morphological terms to avoid faulty implications as to their use. Functional interpretations for each of the feature types are presented below. These interpretations are based primarily on the content of the fill and associated artifacts and debris. Table 3 details the material recovered from the pit features by morphological type.

Irregular-Shaped Pits

The seven irregular-shaped pits were encountered in Components III, IV, V, and VII. In many instances they were the remains of ephemeral pits, and

Table 2. Characteristics of fire-cracked rock concentrations, Taliaferro site.

Concentration No.	Excavation Area	Component	Dimensions (cm)	No. of Rocks	Associations
A	B	IV	73 x 66	39	none
B	B	IV	90 x 70	46	Feature 5
C	A S½	III	60 x 45	47	Feature 28
D	A S½	VI	150 x 140	55	Feature 33
E	A S½	III	50 x 30	34	Feature 35, 38

except for Feature 2, were fairly small in volume and surface area. The presence of oxidation and large amounts of charcoal indicates in-place burning. Most likely they were minimally firepits that were used during a single occasion. The recovered artifacts, debitage, and plant macrofossils probably were introduced into the features accidentally during processing or manufacturing activities conducted in the area of the feature.

The irregular-shaped pits in Component VII, Features 1 and 2, occurred between the two areas containing the most artifacts, debitage, and bone. Fire-cracked rocks also were scattered throughout the area. The two features were probably hearths around which several daily activities took place. These tasks included preparing meals, manufacturing tools, and processing several species of seeds. Features 4 and 24 in Component V were about a meter apart, and the highest densities of artifacts, debitage, and bone were located just to the south. These two features most likely served the same function as those in Component VII. The one irregular-shaped pit in Component IV, Feature 27, appears to represent a locus of more ephemeral activities than the four from the other Late Prehistoric components. Cultural debris was sparse around Feature 27, and material was most dense in the vicinity of the other features belonging to the component. Only five charred goosefoot seeds were recovered from the fill of Feature 27.

Each of the two irregular-shaped pits from Component III, Features 35 and 36, were just above and to the side of a rock-filled basin. Feature 35 was associated with Feature 38, and Feature 36 was adjacent to Feature 37. Both feature groups probably represent serial or simultaneous tasks. Charcoal created from fires in the irregular-shaped pits possibly was scraped into the adjacent basin for heating the rocks. The heated rocks could then be removed for use in cooking, or the basin with the rocks and charcoal could have functioned as an oven or roasting pit. Ethnographically, oven pits were used to cook both animal and plant foods (Kelly 1932; Smith 1974). Because of the lack of depth of these features, small animals, such as rabbits, may have been roasted in them.

Bell-Shaped Pits

Two bell-shaped pits, Features 9 and 12, belonged to the Late Prehistoric Component V. Because charred seeds, bone, charcoal, and debitage were present

Table 3. Material recovered from pit features by morphological type, Taliaferro site.

Feature Number	Component	Artifacts	Debitage				Bone		Plant Macro-fossil[a]	Charcoal[b]
			Primary	Secondary	Tertiary	Total	No.	wt.(g)		
				Irregular-Shaped Pits						
1	VII	1 Preform	-	-	8	8	-	-	4	much
2	VII	1 Preform	-	1	6	7	-	-	6	much
4	V	-	-	-	-	-	-	-	-	much
24	V	-	3	2	32	37	6	0.1	6	much
27	IV	-	-	-	-	-	-	-	-	some
35	III	-	-	-	15	15	-	-	0	some
36	III	-	-	-	1	1	-	-	1	some
				Bell-Shaped Pits						
9	V	1 Preform fragment	3	10	90	103	20	5.8	5	much
12	V	-	1	3	9	13	7	1.1	3	much
				Rock-Filled Basins						
14	V	1 Slab metate fragment 1 Stone bead	1	1	11	13	7	0.7	7	much
22	VII	-	-	3	11	14	8	0.3	0	much
28	IV	-	-	1	1	2	-	-	2	little
37	III	-	-	-	17	17	7	2.2	0	some
38	III	-	1	0	0	1	-	-	0	much
				Oxidized Basins						
6	IV	-	-	-	-	-	-	-	3	much
15	IV	-	1	11	29	41	25	3.4	7	much
				Stratified Basin						
30	VI	1 Projectile point, 1 preform fragment, 1 preblank, 2 indeterminate biface, 1 core, 1 retouched flake, 1 incised sandstone fragment, 1 bone bead	58	152	3035	3245	62	4.3	10	much

Table 3. Concluded.

Feature Number	Component	Artifacts	Debitage				Bone		Plant Macro-fossil[a]	Charcoal[b]
			Primary	Secondary	Tertiary	Total	No.	wt.(g)		
				Large Basins						
7	IV	-	-	-	-	-	-	-	6	much
16	IV	1 Final biface tip	6	21	39	66	6	16.4	9	much
34	VI	-	5	1	6	12	-	-	3	much
				Medium Basins						
13	II	-	1	1	22	24	-	-	0	little
17	IV	-	-	4	7	11	-	-	5	much
20	III	-	4	5	35	44	-	-	1	little
21	II	-	-	-	13	13	-	-	0	little
26	IV	1 Preform fragment	2	2	21	25	23	2.4	6	some
				Small Basins						
5	IV	-	-	-	1	1	1	0.1	5	some
10	V	-	1	2	6	9	9	3.4	5	much
18	IV	-	-	-	-	-	-	-	7	little
19	I	-	-	2	1	3	-	-	0	none
25	I	-	-	3	11	14	-	-	1	little
29	VI	-	-	-	-	-	-	-	2	much
33	VI	-	-	-	-	-	-	-	0	little

[a]Number of taxa

[b]Relative amount

in each, they probably served multi-functions. They may have functioned as roasting pits where heated rocks and charcoal were used to cook animal or plant foods. The hot rocks and charcoal probably were obtained from other firepits and added to the roasting pits in layers with the food, as described by Smith (1974) for the Ute. Roots and tubers were usually covered and left in these pits for 24 hours. Following these baking activities, refuse, including bone and debitage, was incorporated into the fill of the pits. However, most debris resulting from activities during this occupation was probably dumped to the south. The area to the south of the features contained the most dense concentrations of artifacts, debitage, and bone for the component.

Rock-Filled Basins

The five rock-filled basins were found in Components III, V, and VII. The number of rocks per feature ranged from 69 in Feature 14 to six in Feature 22. Two, Features 14 and 38, contained evidence of oxidation, and most yielded large quantities of charcoal. The presence of fire-cracked rock, some oxidation, and charcoal suggests that these pits were used to heat rocks for roasting or cooking activities as noted above in the example of Ute roasting roots and tubers. Additionally, red hot stones along with rabbits or ground seeds were placed in baskets of water for cooking (Lowie 1924; Steward 1933).

The rock-filled basin in the Late Prehistoric Component VII, Feature 22, was in an area with dense concentrations of flaked stone artifacts, debitage, and bone. The feature also was located between the two irregular-shaped pits. Apparently several activities, including stone tool manufacture, seed processing, and the cooking of animal foods, occurred in the vicinity of the feature. Heated cobbles used in cooking probably were dumped to the west of the feature, as indicated by concentrations of rock found there.

Feature 14, the rock-filled basin belonging to the Late Prehistoric Component V, contained a single layer of 69 fire-cracked quartzite cobbles as well as large amounts of charcoal, some oxidation, and a wide variety of charred seeds. The feature was situated just west of the fire-cracked rock scatter and was in an area of low artifact, debitage, and bone densities. Most likely, a layer of rocks was placed at the bottom of the pit on which a fire was built. This feature probably served as an oven pit for roasting animal foods such as rabbit. Bones of this species were recovered from the fill. During ethnographic times, rabbits and other small mammals were cooked in oven pits (Kelly 1932; Lowie 1924). The feature may also have functioned as a pit for heating rocks for cooking food in baskets. The charred seeds found in the fill probably were incorporated accidentally into the feature during nearby processing activities.

Three rock-filled basins were encountered in the Late Archaic Component III. Two, Features 37 and 38, were just below and to the side of an irregular-shaped pit. Feature 37 was associated with Feature 35 and Feature 38 was adjacent to Feature 36. As mentioned above, these feature groups probably represent serial or simultaneous tasks. Charcoal from the irregular-shaped pits possibly was placed into the rock-filled basins to create an oven for roasting animal or plant foods. Associated with Feature 38 was Fire-cracked Rock Concentration E where rejected rocks used in the roasting ovens probably were dumped. The third rock-filled basin, Feature 28, lacked an associated irregular-shaped pit but was adjacent to Fire-Cracked Rock Concentration C. This rock-filled basin probably served a similar purpose as the others from Component III. Because of the depth of these features, they probably were used to roast small animals, such as rabbits, as described in the ethnographic literature (Kelly 1932). Additionally, these rock-filled basins may have functioned as firepits to heat rocks for boiling water in baskets or skin bags; bone grease or juice could have been produced in the baskets. Concentrations of fragmentary bone occurred near the features indicating bone juice and/or grease was manufactured here. This activity requires the boiling of crushed bone in baskets, skin bags, or pottery vessels to release the juice or grease.

Oxidized Basins

The two oxidized basins occurred in the Late Prehistoric Component IV, and each was associated with a multiple feature group. These groups probably represent several serial or simultaneous tasks. The presence of a large number and wide variety of charred plant macrofossils suggests that one of these activities was the processing of seeds. The oxidized basins with evidence of in-place burning could have served as a firepit where hot coals were obtained for use in roasting the seeds. The seeds most likely were parched in basket trays with coals as noted in the historic and ethnographic reports (Chamberlin 1911; Powell 1875).

The highest densities of flaked stone artifacts, debitage, and fire-cracked rock were in the vicinity of the two multiple feature groups. Most of the bone was recovered from around the northern multiple feature group. As indicated by the associated remains, other activities associated with the feature groups include flaked stone tool production, heating of rocks for cooking in baskets or roasting in pits, and the processing of animals for meat, marrow, or bone grease.

Stratified Basin

This large, unique basin, Feature 30, was encountered in the Late Prehistoric Component VI (Chapter 4; Figures 58 and 59). Most likely the basin was originally covered by a temporary structure and represents a concentrated living area. The windbreak probably was constructed around the west side, the side of the prevailing winds, and opposite the scatter of fire-cracked rock. The size and shape of the basin is consistent with habitations recorded in the historic and ethnographic literature for the Intermountain West (Lowie 1924; Simpson 1876). Often these dwellings consisted of piles of sagebrush, which provided a wind-free and shaded work and sleeping area.

The area on the downslope side, to the east and north of the basin, contained the highest density of flaked stone artifacts, debitage, and bone. The fire-cracked rock scatter also occurred on this leeward side. Additionally, the basin fill yielded numerous microflakes, bone fragments, and charred seeds representing 10 taxa. The recovery of large quantities of debris from within and around the feature indicates that several tasks were performed in the wind-free, shaded area. These activities probably included the cooking of animals, manufacturing of flaked stone tools, and the processing of seeds. While traveling through the Great Basin in 1859, Simpson (1876) described such a sheltered area where a group of Indians were engaged in several simultaneous tasks. Further interpretations and discussions concerning this feature are provided in Chapter 4 under the feature descriptions for Component VI and under spatial relationship of remains in Chapter 5.

Large Basins

The three large basins were found in the Late Prehistoric Components IV and VI. The two, Features 7 and 16, from Component IV were associated with the multiple feature groups. These multiple features probably represent several serial or simultaneous tasks, especially the processing of seed foods as attested by the recovery of large quantities of several taxa of charred plant macrofossils. According to ethnographic sources, seeds were threshed, winnowed, and parched with hot coals in basket trays (Chamberlin 1911; Kelly 1932; Powell 1875). The rejected coals from the parching could have been dumped in the large basins. During the processing, charred seeds probably were incorporated accidentally into the features. As mentioned under the functional interpretations for the oxidized basins, several other tasks were performed in the vicinity of the multiple feature groups. Trash from activities, such as flaked stone tool production and cooking, were introduced into the large basins as well. Feature 34, the large basin from Component VI, belonged to the occupation layer below the one containing the large stratified basin, Feature 30. Feature 34 probably served as a dump for debris resulting from seed processing and flaked stone tool manufacture.

Medium Basins

The five medium basins were encountered in Components II, III, and IV. The features classified under this category may have served several functions. Though the evidence is meager, the medium basins in Components II and III, Features 13, 20, and 21, may have been pits where some kind of organic materials were stored and later decayed. These features contained only small amounts of charcoal and lacked oxidation, fire-cracked rock, and bone, which indicates that their function was other than as warming or cooking hearths. According to the ethnographic literature, seeds and roots collected mostly during the fall were stored in pits lined with grass and covered with grass and earth (Kelly 1964; Steward 1933). Some Indian groups stored food in baskets, which were buried in pits (Chamberlin 1911). Steward (1941) also mentions that seeds were placed in groundhog skin or sagebrush bark bags before being covered in pits.

The other two medium basins, Features 17 and 26, from the Late Prehistoric Component IV probably were roasting pits for plant or animal foods. Both contained charcoal, debitage, and charred plant macrofossils. Feature 26 yielded bone, and Feature 17 was part of the multiple feature group where the highest densities of bone occurred for the component. As with the rock-filled basins, hot coals and rocks probably were placed in the pits to roast small mammals, such as rabbits. Debitage and charred seeds were incorporated into the features from nearby manufacturing and processing activities.

Small Basins

The seven small basins were found in Components I, IV, V, and VI. Because of their small volume and lack of oxidation, they probably served as dumps for refuse; however, the two from the Early Archaic Component I may be deflated fire or roasting pits. Features 5 and 18 from the Late Prehistoric Component IV were associated with the two multiple feature groups. They probably represent trash dumps resulting from the seed processing, flaked stone tool manufacturing, or cooking that occurred in the vicinity of these feature groups. The small basin from Component V, Feature 10, yielded large amounts of charcoal, some debitage, bone fragments, and several taxa of charred seeds. It may have functioned as a roasting pit in a similar manner to the rock-filled basins and some of the medium basins described above. Of the two small basins belonging to Component VI, Feature 29 is next to the large stratified basin and is a small dump of sagebrush charcoal. The other, Feature 33, is within Fire-cracked Rock Concentration D and probably formed when the rocks were rejected after cooking activities.

SUMMARY

The following summarizes the pit feature types and their functional interpretations.

1. Irregular-shaped pits had irregular plan views, shallow cross sections, large quantities of charcoal, and oxidation along the bottom. They probably were ephemeral, unprepared firepits.

2. Bell-shaped pits had circular plan views, concave sides, large quantities of charcoal, bone fragments, debitage, and several taxa of charred seeds. They may have functioned as roasting pits where heated rocks and charcoal were used to cook animal or plant foods.

3. Rock-filled basins contained fire-cracked rocks, most had large quantities of charcoal, and some had oxidation. Rocks for roasting or cooking activities probably were heated in these features. The heated rocks could have been used in baskets or in other pits.

4. Oxidized basins were characterized by the presence of oxidation and charcoal and the lack of fire-cracked rocks. Both were part of the two multiple feature groups and probably were firepits where hot coals were obtained for parching seeds in baskets. These features may have been used in other activities requiring a firepit.

5. The large stratified basin measured over 2 m in diameter and 30 cm deep and contained large quantities of charcoal, flaked stone tools, debitage, bone, and charred seeds. Most likely the basin was originally covered by a temporary sagebrush structure or wickiup and represents a concentrated living area where several activities took place.

6. Large basins had the largest surface area and volume of the basin-shaped pits, except for the stratified basin. They contained large quantities of charcoal and several taxa of charred seeds. Two were part of multiple feature groups. They probably were used during the serial or simultaneous tasks associated with the multiple features. The large basins may have been dumps for the rejected coals from seed parching.

7. Medium basins had surface area to volume ratios that fell between those of the large and small basin-shaped pits. Some of the medium basins contained only small amounts of charcoal and lacked oxidation, fire-cracked rocks, and bone. These probably functioned as storage pits. Two yielded charcoal, debitage, and charred plant macrofossils and may have been roasting pits for small mammals.

8. Small basins had the smallest surface area and volume of the basin-shaped pits. They probably represent trash dumps resulting from seed processing, flaked stone tool manufacturing, or cooking. A few may be deflated firepits.

APPENDIX B

ARTIFACT ANALYSIS

By C. S. Smith

FLAKED STONE ARTIFACTS

A total of 1018 flaked stone tools and 65,469 pieces of debitage was recovered during the excavations at the Taliaferro site. The artifacts were analyzed within a technological scheme using the standard procedures of Archaeological Services of Western Wyoming College. For this classificatory scheme, artifacts are grouped according to their stage in the reduction continuum of stone tool manufacture, which includes a series of sequential steps from the collection of the raw materials to the completion of the final implement. Each stage in the sequence is defined by certain technological and morphological attributes and is considered as a separate artifact class in the following descriptions.

Three reduction sequences resulting in different idealized end products are evident in the artifact assemblage recovered during the excavations: one is the retouching or use of flakes that are removed from a nodule or core, another is the expedient modification of cobbles or pebbles for tools, and the third is the reduction of bifaces into implements. Figure 1 schematically details the three sequences with each of the stages or artifact classes represented. Though each is viewed as a series of steps in the manufacture of a final end product, artifacts belonging to any stage could have become a tool.

The artifact classes included in the flake tool reduction sequence are cores, retouched flakes, and utilized flakes. For this analysis, the continuum of biface manufacture as illustrated by Holmes (1919:Figure 49) is divided from first to last stages into preblanks, blanks, preforms, and end products. Using morphological shape, the end products are classified further into projectile points, drills, and notched knives. The terms used for the various end product artifact classes are descriptive and are not necessarily intended to imply function.

The flake stone tools recovered from the site consist of 44 cores, 50 retouched flakes, 59 utilized flakes, 17 modified cobbles and pebbles, 131 preblanks, 114 blanks, 338 preforms, 11 drills, five large notched knives, 47 final biface fragments, 84 indeterminate bifaces, and 118 projectile points. These are more fully described below. The 65,469 pieces of debitage, or waste remains from the production of flaked stone tools, are discussed as well. These descriptions contain tables which detail by artifact class and catalog number the characteristics of each specimen. These characteristics include component, material type, shape, and measurements. Where applicable, cross-tabulations of material type by component as well as tables of the mean, standard deviation, and variance of the measurements broken down by component are given for each artifact class. The ephemeral Late Prehistoric Component VIII is not considered in most of the analyses because only a single flaked stone artifact (a small, side-notched projectile point) was recovered.

The primary focus of the analysis of the flaked stone artifacts in this appendix (other than projectile points presented) is the examination of significant changes through time in the material type and size of the specimens in each category. The chi-square test was used to see if significant differences in material types exist between the components. To measure the strength of relationship, the Cramer's V was calculated. Cramer's V statistic ranges between 0 and 1, with large values signifying a high degree of association. The Kruskal-Wallis one-way analysis of variance, a non-parametric test, was conducted to test whether the length, width, and thickness measurements of the flaked stone artifacts are significantly different between components.

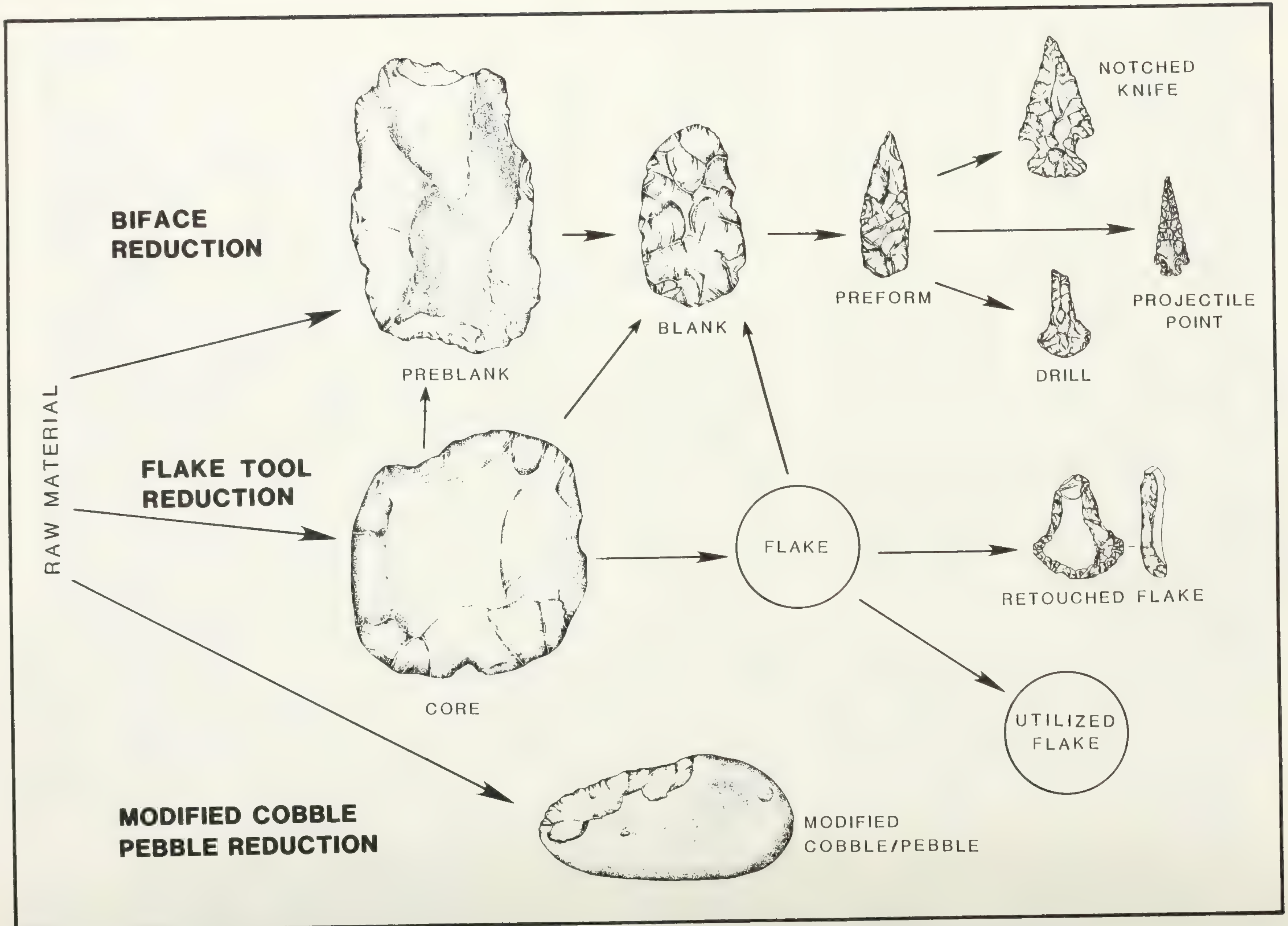


Figure 1. The three reduction sequences for the production of flaked stone tools present at the Taliaferro site.

These tests show that significant differences in material type and size of the specimen for several artifact classes in the biface reduction sequence do occur through time. Overall, the Archaic components tend to have large blanks and preforms made from quartzite, and the Late Prehistoric periods have smaller artifacts of translucent algalitic chert. These differences through time are probably a function of the size of the cobbles available in the site vicinity; only quartzite occurs in large enough cobbles to produce the larger artifacts of the earlier periods. Because they were interested in smaller tools, the Late Prehistoric people took advantage of the small, more flakable translucent algalitic chert pebbles. No significant differences in the size and material type of the artifacts between components were present for the flake reduction or the cobble and pebble modification sequences.

The focus of the debitage analysis was the examination of differences between components in the cumulative percentage curves of the primary, secondary, and tertiary flakes. The relative percentages of these flake types provide an estimation of the kind of reduction activities conducted at the site. These curves are almost identical for all components, which indicates that similar stone tool production activitives (probably the complete reduction sequence) were present throughout the prehistory of the site.

For the projectile points, the analysis focused on the delination of morphological types for chronological purposes. The points were grouped into several descriptive categories, which were then compared to similar morphological types detailed in the literature of the Great Basin and Great Plains. Several chronological distinctive types which correspond with the temporal placement and shape of recognized (named) types in the surrounding regions were recovered from the Taliaferro site.

Raw Material Types

The first step in the production of chipped stone implements is the procurement of flakable (usable) raw materials. In the vicinity of the Taliaferro site, as well as in many areas of the Green River Basin, a ready supply of raw material is available in the form of lag cobbles and pebbles. The ridge tops within the site area are strewn with cobbles of quartzite and cherts which were extensively exploited prehistorically. Though in smaller quantities, obsidian also is present as pebbles in the gravels on the Pleistocene terraces west of the Green River between the towns of Green River and Big Piney (Love 1977:21).

All materials used prehistorically at the Taliaferro site appear to have been obtained from these secondary sources. In the analysis of the flaked stone tools and debitage, the material types were categorized into three major types: quartzite, obsidian, and silicates such as cherts and agates. The quartzite cobbles occurring in the site area were derived geologically from the erosion of the Precambrian metamorphics of the Wind River Range (Love 1987). Most of the larger cobbles of usable toolstone locally available to the prehistoric inhabitants were of quartzite.

Pebble obsidian is present in small amounts in the collection from the Taliaferro site. The geologic primary source, or volcanic vent, of this obsidian is unknown, but it may be in the east central portion of the Wyoming Range (Love 1977:21). The majority of the flaked pebbles of obsidian recovered during the excavations have a maximum length of 3 to 4 cm.

Erosion of the lacustrine and alluvial deposits of the Eocene Green River and Bridger formations has exposed a wide variety of silicates throughout the Green River Basin. Depending on the environment of depostion or formation, they occur in numerous colors resulting from impurities. Some silicates are amorphous and pure and others contain invertebrate remains, algal colonies, or oolites. Eventually these various types can be identified to geologic formation and locality, but as yet, the data is unavailable (Miller 1986). The primary source, however, is relatively unimportant for considerations of prehistoric movements of people associated with the Taliaferro site because most silicates in the collection are from eroded pebbles or cobbles common on ridges and terraces in the site vicinity.

For descriptive purposes, the silicates recovered during the excavations were classified as translucent algalitic chert, opaque algalitic chert, Whiskey Buttes chert, moss agate, and Church Buttes chert. These categories follow the names and descriptions detailed in Instructions for Cataloging Artifacts (Archaeological Services of Western Wyoming College 1983:9-10) with additional information provided by Miller (1986c). Examples of each type are stored in the compartive collection at Western Wyoming College. Some of these types are thought to have locally specific sources in the Green River Basin and are named according to descriptive localities (Love 1977:24-25), but most probably have a fairly wide distribution.

By far the dominant silicates in the assemblage are those classified as algalitic cherts, including both translucent and opaque varieties. This category contains a wide range of cherts of various colors that were formed under several different environmental conditions. Most of the translucent cherts are derived from deep lake deposits and often have remains of algal growth. The opaque variety probably resulted from the replacement of algae with silica. All abound in the site vicinity as cobbles ranging from 2 to 8 cm in diameter. Some cobbles of opaque algalitic chert are slightly larger.

Whiskey Buttes chert is a distinictive algalitic chert that was orginally named for a localized outcrop southeast of Whiskey Buttes located several miles south of the Taliaferro site (Love 1977:24). It is an opaque brown and white chert with lacy, blue algae structures which formed in the Eocene Bridger Formation deposits by the replacement of algae with silica. Small cobbles of this material may occur in the gravels on the ridges and terraces near the site, or the material could have been obtained directly from the Whiskey Buttes outcrops.

Another material type found in small quantities in the collection is moss agate, which is actually a dendritic opal. It is usually clear to white with a waxy luster and contains impurities of manganese oxide which appear as branching bodies within the stone. Small moss agate cobbles probably occur on the ridges around the site.

The final material category, noted only rarely in the assemblage from the site, is Church Buttes chert (also referred to as Granger Green). It is a distinictive opaque green chert that occurs as both in situ layers and lag cobbles in the area surrounding Church Buttes located in the southern portion of the Green River Basin, some 30 miles south of the site. The limits of its natural distribution are unknown.

Debitage

Debitage, including flakes, shatter, and tested material, is the material detached from a piece of stone during the various stages of tool manufacturing (Chapman 1977). Using characteristics, the flakes can be grouped to roughly correspond with the reduction stage in which they were produced. The initial flakes removed from a piece of raw material are quite different from those resulting from the later steps in the reduction sequence. In addition to being discarded waste material, flakes can be used as is without further modification, tools, can be retouched to produce a desired edge shape, or be facially reduced into a variety of bifacial tool forms.

The 65,469 pieces of debitage recovered from the Taliaferro site were classified by material type and debitage type following the standard procedures of AS-WWC. Debitage containing a striking platform and bulb of percussion were grouped as either primary, secondary, or tertiary flakes, depending on the amount of cortex on the dorsal surface. Those typed as primary flakes have at least 90% cortex, secondary flakes have 1 to 90%, and tertiary flakes lack cortex. Using the amount of cortex as one attribute for flake classification provides a rough estimate as to place in the stone tool manufacturing sequence: primary flakes generally are removed in the early stages of reduction while tertiary flakes are produced during the later thinning stages. This is only an estimation because flakes resulting from the final stages of tool manufacture can retain cortex depending on the shape and size of the raw material.

Bifacial thinning flakes are a distinctive tertiary flake that display a lipped, double-faceted platform and contain evidence of crossing at least half way across the artifact face. Pieces of debitage that lack the attributes of the flakes, bulb of percussion and striking platform, and are chunky or blocky were classified as shatter. Shatter is produced during most stages of tool manufacture. Debitage included as tested material are cobbles, pebbles, or chunks of raw material that exhibit three or fewer flake scars.

Table 1 presents the crosstabulation of debitage type by component. Of the three flake types, primary flakes are represented by the lowest percentage of the total for each component, ranging between 8 and 14%. The next most common flake type, secondary flakes, makes up between 18 and 26% of the total. Tertiary flakes dominate the collection from each component with percentages from 51 to 62. This distribution of flake types at the Taliaferro site is what would be expected if the entire reduction sequence from the removal of the first flakes to the final shaping of the implements was taking place. Except for the initial reduction stages, most flakes resulting from the manufacture of a final tool would be tertiary flakes, especially in this analysis where most flakes without cortex are lumped into one category.

A graphic representation of the cumulative percentages of the flake types for each component is shown in Figure 2. For this plot, the bifacial thinning flakes were combined with tertiary flakes, and shatter and tested material were excluded from the total. As this figure clearly shows, all components are represented by almost identical curves, indicating that similar stone tool production activities were present during each period of occupation at the site.

For comparsion, the flake types from Components I and IV at the Maxon Ranch Site (Harrell and McKern 1986) are also plotted. Both components have considerably lower percentages of primary and secondary flakes than any of the eight components from the Taliaferro site. This indicates that the initial stages of tool reduction were more important activities at the Taliaferro site than it was for the two components at the Maxon Ranch site. The flake stone tool production activities occurring during the two components at the Maxon Ranch site probably concentrated solely on the later thinning steps while all stages in the sequence of stone tool manufacture were performed at the Taliaferro site. The low frequency of debitage at the Maxon Ranch site, 1564 pieces in Component I and 1060 in Component IV, suggests that the manufacture of stone implements played only a minor role. The higher percentage of primary and secondary flakes is as expected for a site like the Taliaferro

Table 1. Crosstabulation of debitage type by component, Taliferro Site.

Component		Debitage Type Primary	Second	Tertiary	Bifacial Thinning	Shatter	Tested Material	Total
I	#	1662	2183	7183	71	336	31	11,478
	Row %	14.48	19.02	62.69	0.62	2.93	0.27	17.53
	Column %	21.62	15.01	18.98	3.93	10.27	11.88	
	Total %	2.54	3.33	10.99	0.11	0.51	0.05	
II	#	1182	2059	4534	76	156	17	8024
	Row %	14.73	25.66	56.51	0.95	1.94	0.21	12.26
	Column %	15.37	14.16	11.96	4.21	4.77	6.51	
	Total %	1.81	3.14	6.93	0.12	0.24	0.03	
III	#	964	1725	4500	196	463	33	7881
	Row %	12.23	21.89	57.10	2.49	5.87	0.42	12.04
	Column %	12.54	11.86	11.87	10.85	14.15	12.64	
	Total %	1.47	2.63	6.87	0.30	0.71	0.05	
IV	#	293	897	1735	268	153	17	3363
	Row %	8.71	26.67	51.59	7.97	4.55	0.51	5.14
	Column %	3.81	6.17	4.58	14.84	4.68	6.51	
	Total %	0.45	1.37	2.65	0.41	0.23	0.03	
V	#	675	1615	4526	313	449	37	7615
	Row %	8.86	21.21	59.44	4.11	5.90	0.49	11.63
	Column %	8.78	11.10	11.94	17.33	13.73	14.18	
	Total %	1.03	2.47	6.91	0.48	0.69	0.06	
VI	#	1100	2138	5295	331	560	61	9485
	Row %	11.60	22.54	55.82	3.49	5.90	0.64	14.49
	Column %	14.31	14.70	13.97	18.33	17.12	23.37	
	Total %	1.68	3.27	8.09	0.51	0.86	0.09	
VII	#	1775	3864	9914	542	1129	65	17,289
	Row %	10.27	22.35	57.34	3.13	6.53	0.38	26.41
	Column %	23.09	26.57	26.16	30.01	34.52	24.90	
	Total %	2.71	5.90	15.14	0.83	1.72	0.10	
VIII	#	37	62	201	9	25	0	334
	Row %	11.08	18.56	60.18	2.69	7.49	0.00	0.51
	Column %	0.48	0.43	0.53	0.50	0.76	0.00	
	Total %	0.06	0.09	0.31	0.01	0.04	0.00	
Total	#	7688	14,543	37,900	1806	3271	261	65,469
	%	11.74	22.21	57.89	2.76	5.00	0.40	100.00

site that has a ready source of exploitable lithic raw material in the vicinity. A site that served solely as a quarry area where the raw material was initially reduced should have even higher percentages of primary and secondary flakes than the collection from the Taliaferro site.

The comparisons of the percentages of the various flake types between sites is done under the assumption that the same kinds of raw materials were used. If large chunks of raw material with little cortex from a primary source were reduced, only a few flakes would be classified as primary or secondary even though the entire stone tool manufacturing sequence was conducted at the site. In contrast, secondarily deposited cobbles would yield a much higher percentage of flakes with cortex. At the Taliaferro site, as

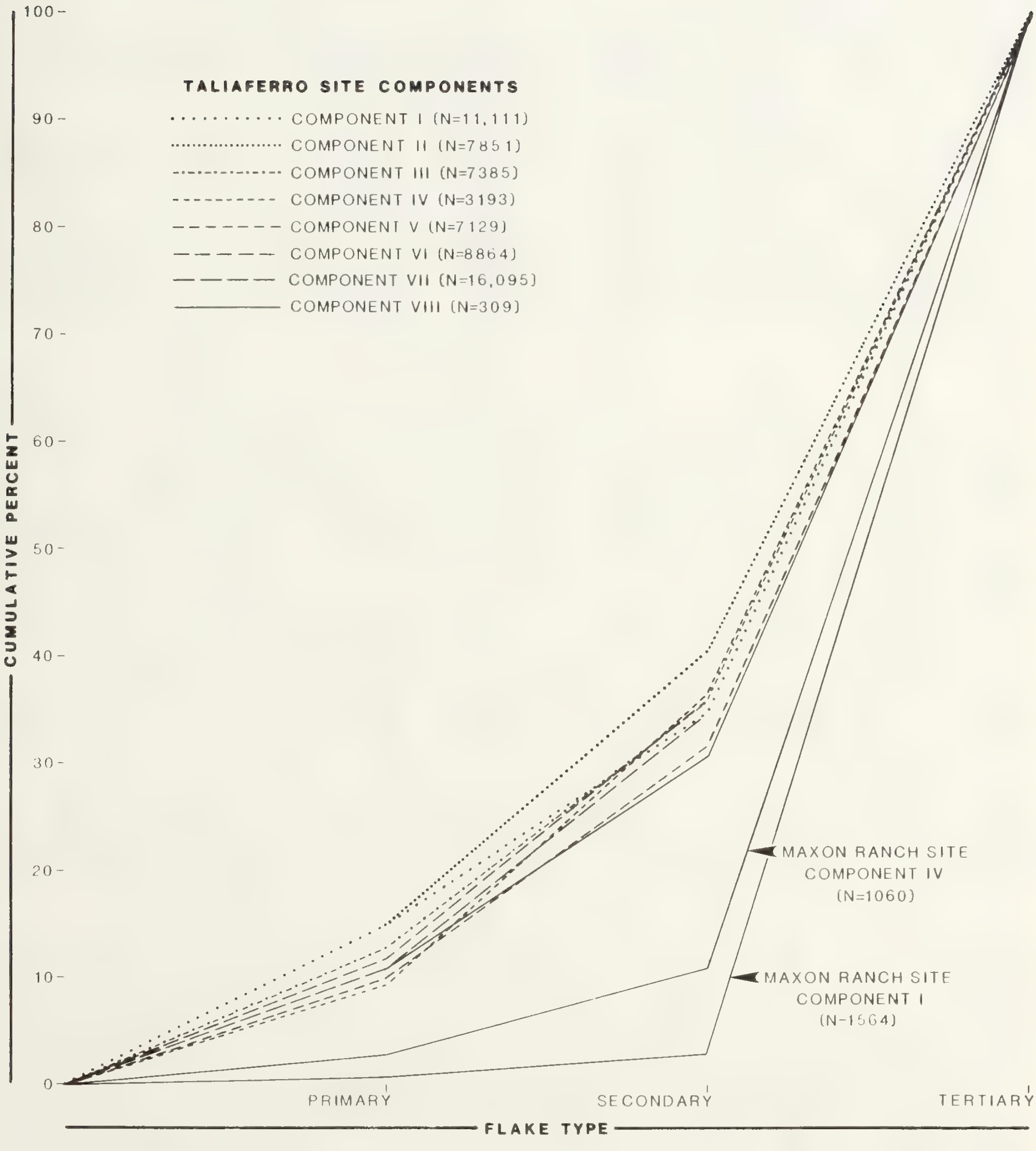


Figure 2. Cumulative percentage curves of primary, secondary, and tertiary flakes for each component at the Taliaferro site, Lincoln County, Wyoming, and Components I and IV at the Maxon Ranch site, Sweetwater County, Wyoming.

well as the Maxon Ranch site, the important raw materials were probably in the form of cobbles, which allows the above interpretations.

The debitage from the Taliaferro site was sorted by material type categories consisting of translucent and opaque algalitic chert, quartzite, Whiskey Buttes chert, obsidian, and other. Table 2 details the cross-tabulation of the material types by component. Quartzite dominates the collection from the Archaic Components I-III (ranging between 45 and 56% of the total) with opaque algalitic chert being the second most common material type. In contrast, at least half of the debitage is of translucent algalitic chert in the Late Prehistoric components, except for Component VI which has only 35 percent, just slightly higher than the percentages for opaque algalitic chert and quartzite. Whiskey Buttes chert and obsidian occur in all components in only small amounts though the frequency for Whiskey Buttes chert in the Archaic components is slightly higher than in the Late Prehistoric components. The reverse is true for obsidian.

This distribution of debitage material types between the Archaic and Late Prehistoric period components is similar to that of the flaked stone tools at the Taliaferro site. As shown in the following discussion of the flaked stone tools, there is a significant difference through time in the material types used for the manufacture of blanks and preforms. Quartzite is the dominant material in the Archaic components and translucent algalitic chert is the most common material during the Late Prehistoric period.

Cores

Cores are remnants from the flake tool reduction sequence. They exhibit scars and prepared striking platforms resulting from the removal of flakes. These flakes are retouched into implements or used unmodified. Instead of being discarded, some cores may be further reduced in the biface tool production continuum. Artifacts having two definite faces and a discoidal shape, which may have functioned partly as cores, are considered in the preblank category.

Forty-four artifacts recovered from the Taliaferro site were included in this category. They were divided into residual, multidirectional, and discoidal cores using location of platform preparation and direction of flake removal. The component, material type, and measurements for each core by type and catalog number is provided in Table 3.

Table 4 shows the mean, standard deviation, and variance of the length, width, and thickness of the cores by component. The Kruskal-Wallis one-way analysis of variance was used to determine if significant differences exist in the size of these artifacts. The test was conducted under the null hypothesis of no difference to be rejected at the .05 alpha level. The H value was 11.586 significant at the .072 level for the length measurements, it was 7.704 significant at the .261 level for the width, and it was 8.171 significant at the .226 level for the thickness. Given these figures, the null hypothesis cannot be rejected. This indicates that between components there is no significant difference in size of cores, though the mean measurements of the cores from the earlier components are larger than those from the later ones.

The crosstabulation of all cores by material type and component is shown in Table 5. The predominant material type in the collection is quartzite with 26 specimens or 59.1% of the total. Translucent algalitic chert is the second most common material at 25.0%. The remaining seven cores are distributed among opaque algalitic chert, moss agate, Whiskey Buttes chert, and obsidian. Component I, containing the most, yielded 12 specimens, and the Late

Table 2. Crosstabulation of debitage material type by component, Taliaferro Site.

Component		Material Type: Translucent Chert	Opaque Chert	Quartzite	Whiskey Buttes Chert	Obsidian	Other	Total
I	#	604	3679	6231	834	19	111	11,478
	Row %	5.26	32.05	54.29	7.27	0.17	0.97	17.53
	Column %	3.03	19.32	27.05	35.31	2.60	33.74	
	Total %	0.92	5.62	9.52	1.27	0.03	0.17	
II	#	654	2272	4569	466	17	46	8024
	Row %	8.15	28.32	56.94	5.81	0.21	0.57	12.26
	Column %	3.28	11.93	19.83	19.73	2.32	13.98	
	Total %	1.00	3.47	6.98	0.71	0.03	0.07	
III	#	1224	2687	3611	296	39	24	7881
	Row %	15.53	34.09	45.82	3.76	0.49	0.30	12.04
	Column %	6.13	14.11	15.68	12.53	5.33	7.29	
	Total %	1.87	4.10	5.52	0.45	0.06	0.04	
IV	#	1773	711	697	85	77	20	3363
	Row %	52.72	21.14	20.73	2.53	2.29	0.59	5.14
	Column %	8.88	3.73	3.03	3.60	10.52	6.08	
	Total %	2.71	1.09	1.06	0.13	0.12	0.03	
V	#	3658	2013	1568	200	137	39	7615
	Row %	48.04	26.43	20.59	2.63	1.80	0.51	11.63
	Column %	18.32	10.57	6.81	8.47	18.72	11.85	
	Total %	5.59	3.07	2.40	0.31	0.21	0.06	
VI	#	3314	2852	2917	194	190	18	9485
	Row %	34.94	30.07	30.75	2.05	2.00	0.19	14.49
	Column %	16.60	14.97	12.66	8.21	25.96	5.47	
	Total %	5.06	4.36	4.46	0.30	0.29	0.03	
VII	#	8520	4773	3404	281	242	69	17,289
	Row %	49.28	27.61	19.69	1.63	1.40	0.40	26.41
	Column %	42.68	25.06	14.78	11.90	33.06	20.97	
	Total %	13.01	7.29	5.20	0.43	0.37	0.11	
VIII	#	216	60	39	6	11	2	334
	Row %	64.67	17.96	11.68	1.80	3.29	0.60	0.51
	Column %	1.08	0.32	0.17	0.25	1.50	0.61	
	Total %	0.33	0.09	0.06	0.01	0.02	0.00	
Total	#	19,963	19,047	23,036	2,362	732	329	65,469
	%	30.49	29.09	35.19	3.61	1.12	0.50	100.00

Prehistoric Components VI and VII each produced eight cores. Each type is briefy discussed below.

Residual Cores

Sixteen artifacts in the collection were classified as residual cores (Table 3). They are amorphous (without definite form) and have an exhausted platform area (Figure 3, a-b). Ten are of quartzite, four are of translucent algalitic chert, and one each is of obsidian and moss agate. Except for three, all belong to the Late Prehistoric Components V, VI, and VII. Half of the total is from Component VII.

Table 3. Characteristics of cores by catalog number and type, Taliferro site.

Catalog Number	Excavation Area	Component	Material Type	Length (mm)	Width (mm)	Thickness (mm)
			Residual Core			
320	B	VII	Quartzite	62.1	48.7	26.5
395	B	VII	Quartzite	44.6	40.9	19.1
412	B	V	Quartzite	51.9	43.5	22.9
553	B	VII	Quartzite	62.6	50.9	26.6
666	B	V	Quartzite	45.8	41.9	21.4
931	B	VII	Quartzite	66.9	52.6	27.3
1017	B	V	Quartzite	46.1	37.8	19.2
1018	B	VII	Translucent Chert	40.4	26.8	15.2
1029	B	VII	Quartzite	53.4	51.1	25.9
1036	B	VII	Quartzite	58.1	51.1	22.3
1193	B	V	Translucent Chert	45.8	33.2	14.4
2200	A S½	VI	Quartzite	61.9	48.6	21.0
2573	A S½	VI	Obsidian	24.2	18.3	11.4
3110	A	III	Translucent Chert	48.2	42.0	16.0
5167	A N½	I	Moss agate	40.9	17.7	18.6
5222	A	II	Translucent Chert	48.7	35.0	29.1
			Multidirectional Cores			
1002	B	V	Opaque Chert	45.8	43.2	30.6
1170	B	VII	Quartzite	68.7	31.6	30.5
1354	B	IV	Quartzite	60.1	46.7	20.6
2088	A S½	VI	Quartzite	62.8	47.1	22.6
2201	A S½	VI	Translucent Chert	62.6	46.2	18.5
2337	A S½	VI	Translucent Chert	51.6	35.3	23.2
2735	A S½	VI	Translucent Chert	60.9	27.0	21.8
2786	A S½	III	Translucent Chert	56.0	48.9	20.1
2951	A S½	III	Quartzite	63.0	55.1	34.1
3069	A S½	III	Translucent Chert	67.9	36.6	32.9
3183	A S½	III	Quartzite	58.2	51.4	19.2
4021	A N½	VI	Quartzite	70.8	55.9	26.6
4073	A N½	VI	Translucent Chert	52.2	45.9	26.1
4242	A N½	II	Quartzite	85.9	45.4	18.9
4306	A N½	II	Quartzite	112.3	66.4	41.2
4461	A N½	III	Quartzite	63.7	48.2	21.2
4509	A N½	I	Quartzite	89.4	73.2	35.7
4589	A N½	I	Quartzite	69.4	39.5	28.1
4676	A N½	I	Quartzite	82.0	66.3	30.5
4680	A N½	I	Quartzite	90.9	66.0	22.5
4786	A N½	I	Opaque Chert	87.7	82.3	53.0
4880	A N½	I	Whiskey Buttes Chert	64.8	41.2	23.4
4986	A N½	I	Opaque Chert	69.3	67.4	37.1
5021	A N½	I	Quartzite	67.1	52.4	25.5
5045	A N½	I	Translucent Chert	56.4	51.7	22.1
5153	A N½	I	Quartzite	97.1	81.8	34.2
5214	A N½	I	Opaque Chert	67.8	56.9	38.6
			Discoidal Core			
697	B	V	Quartzite	100.3	89.0	26.4

Note: All catalog numbers have the prefix SCL14.

Table 4. The mean, standard deviation, and variance of the length, width, and thickness of cores by component, Taliaferro Site.

	Component							
	I	II	III	IV	V	VI	VII	Total
				Length (mm)				
Number	12	3	6	1	6	8	8	44
Mean	73.5	82.3	59.5	60.1	55.9	55.8	57.1	63.3
Standard Deviation	16.3	31.9	6.9	0	21.8	14.2	10.2	17.5
Variance	265.9	1020.9	48.4	0	477.8	201.7	105.0	308.4
				Width (mm)				
Number	12	3	6	1	6	8	8	44
Mean	58.8	48.9	47.0	46.7	48.1	40.5	44.2	48.8
Standard Deviation	17.0	15.9	6.6	0	20.4	12.5	10.0	15.1
Variance	292.2	255.8	44.6	0	416.9	158.5	100.4	228.0
				Thickness (mm)				
Number	12	3	6	1	6	8	8	44
Mean	30.7	29.7	23.9	20.6	22.4	21.4	24.1	25.5
Standard Deviation	9.5	11.1	7.6	0	5.6	4.8	4.9	7.8
Variance	92.0	124.6	58.2	0	31.7	23.2	24.8	62.2

Multidirectional Cores

Twenty-seven specimens were grouped as multidirectional cores (Table 3). They exhibit scars indicating that flakes were removed in a variety of directions (Figure 3, c-d). Material types include 15 of quartzite, 7 of translucent algalitic chert, 4 of opaque algalitic chert, and 1 of Whiskey Buttes chert. The majority, 18, of the multidirectional cores were recovered from the three Archaic components with 11 belonging to Component I. Another six are from Component VI, and the remaining three are from Components IV, V, and VII.

Discoidal Core

One discoilal core of quartzite was recovered from Component V in Excavation Area B (Table 3). This specimen is biconvex in cross section and displays flake scars around the entire margin (Figure 3e). Other discoidal shaped arifacts, which may have served as cores before additional bifacial reduction, were classified in the preblank category.

Utilized Flakes

Utilized flakes include unmodified flakes removed from a nodule or core of raw material that display clear evidence of use wear. Because flakes can obtain edge damage from means other than use, such as trampling or trowling, a conservative approach was taken in the classification. Flakes had to display use scars covering at least 1 cm of an edge. At times it was extremely difficult to determine whether quartzite flakes had use scars. These arifacts are considered as expedient tools in contrast to more modified and formal retouched flakes. Generally a flake would be picked up from a workshop area, used for a specific task, then discarded. The choice of the flake to be used,

Table 5. Crosstabulations of cores by component and material type, Taliaferro Site.

Component		Material Type						
		Translucent Chert	Opaque Chert	Quartzite	Moss Agate	Whiskey Buttes Chert	Obsidian	Total
I	#	1	3	6	1	1	0	12
	Row %	8.3	25.0	50.0	8.3	8.3	0	27.3
	Column %	9.1	75.0	23.1	100.0	100.0	0	
	Total %	2.3	6.8	13.6	2.3	2.0	0	
II	#	1	0	2	0	0	0	3
	Row %	33.3	0	66.7	0	0	0	6.8
	Column %	9.1	0	7.7	0	0	0	
	Total %	2.3	0	4.5	0	0	0	
III	#	3	0	3	0	0	0	6
	Row %	50.0	0	50.0	0	0	0	13.6
	Column %	27.3	0	11.5	0	0	0	
	Total %	6.8	0	6.8	0	0	0	
IV	#	0	0	1	0	0	0	1
	Row %	0	0	100.0	0	0	0	2.3
	Column %	0	0	3.8	0	0	0	
	Total %	0	0	2.3	0	0	0	
V	#	1	1	4	0	0	0	6
	Row %	16.7	16.7	66.7	0	0	0	13.6
	Column %	9.1	25.0	15.4	0	0	0	
	Total %	2.3	2.3	9.1	0	0	0	
VI	#	4	0	3	0	0	1	8
	Row %	50.0	0	37.5	0	0	12.5	18.2
	Column %	36.4	0	11.5	0	0	100.0	
	Total %	9.1	0	6.8	0	0	2.3	
VII	#	1	0	7	0	0	0	8
	Row %	12.5	0	87.5	0	0	0	18.2
	Column %	9.1	0	26.9	0	0	0	
	Total %	2.3	0	15.9	0	0	0	
Total	#	11	4	26	1	1	1	44
	%	25.0	9.1	59.1	2.3	2.3	2.3	100.00

whether it had a sharp, acute edge or a steep edge, would depend on intended use; however, the use of the tool, or its life span, was short.

Fifty-nine artifacts were included as classified flakes. The south half of Excavation Area A contained 8 specimens, the north half of Area A had 22, and Area B produced 29. Table 6 provides a summary of associated component and material type by catalog number of each utilized flake. A crosstabulation of these artifacts by component and material type also was computed (Table 7). The dominant material type in the collection is quartzite with 24 or 40.7% of the total. Translucent and opaque algalitic cherts are represented by 28.8 and 22.0% of the collection respectively. The remaining material types include Whiskey Buttes chert and obsidian. Ulitized flakes are slightly more common in the Late Prehistoric Components V, VI, and VII than in the Archaic ones.

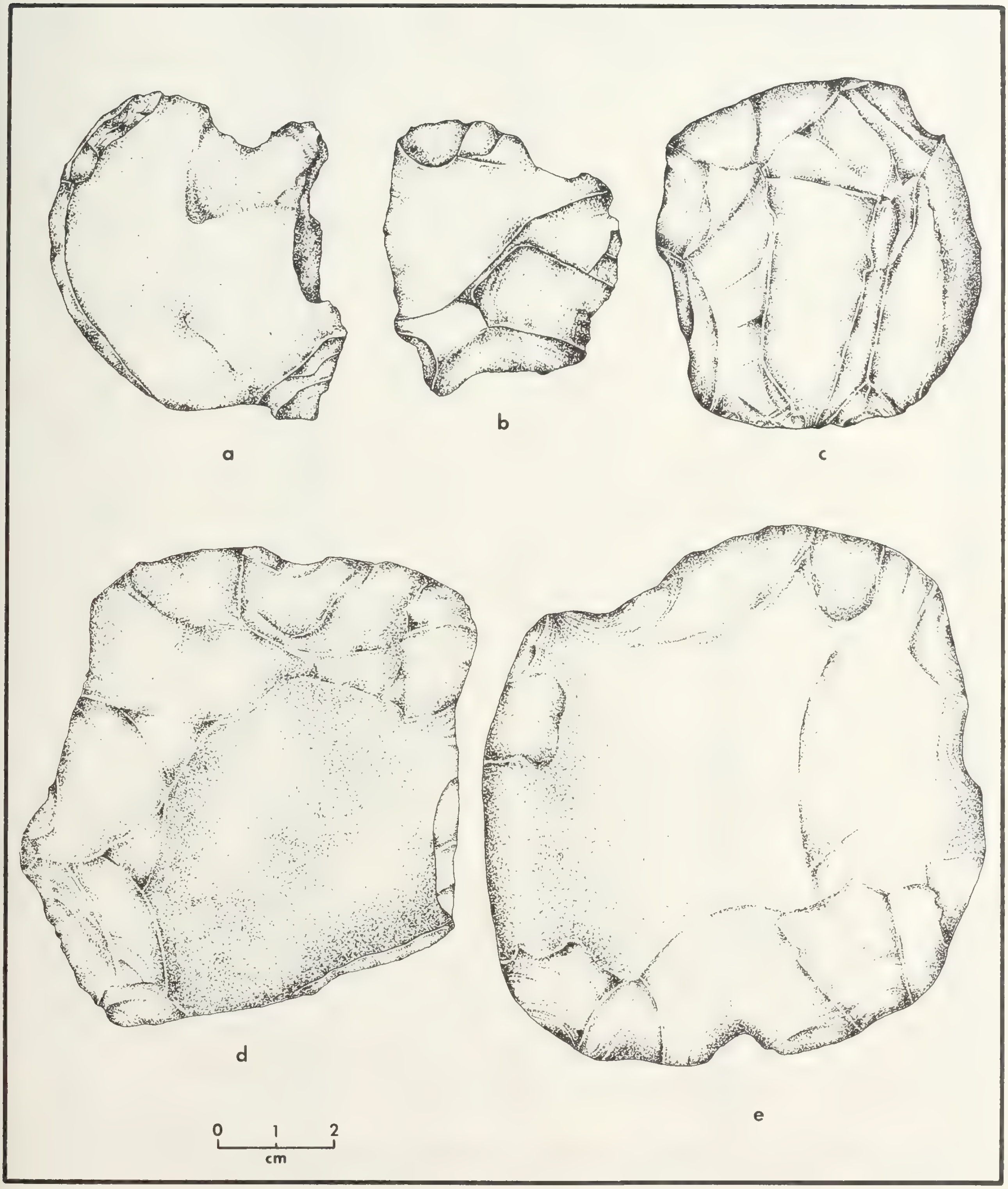


Figure 3. Selected cores from the Taliaferro site. a-b, residual; c-d, multidirectional; e, discoidal. Provenience: Component I, d. SCL14.4509; Component III, b. SCL14.3110, c. SCL14.3183; Component V, e. SCL14.697; Component VII, a. SCL14.553.

Table 6. Characteristics of utilized flakes by catalog number, Taliaferro site.

Catalog Number	Excavation Area	Component	Material Type
264	B	VII	Opaque Chert
289	B	VII	Quartzite
319	B	VII	Quartzite
350	B	VII	Quartzite
353	B	VII	Opaque Chert
355	B	VII	Quartzite
400	B	VII	Translucent Chert
404	B	V	Whiskey Buttes Chert
450	B	VII	Translucent Chert
491	B	VII	Translucent Chert
577	B	VII	Opaque Chert
626	B	V	Quartzite
757	B	V	Translucent Chert
823	B	V	Translucent Chert
888	B	VII	Quartzite
1047	B	V	Translucent Chert
1062	B	V	Translucent Chert
1157	B	VII	Quartzite
1169	B	VII	Translucent Chert
1191	B	V	Translucent Chert
1245	B	IV	Quartzite
1268	B	IV	Obsidian
1270	B	V	Quartzite
1339	B	VII	Opaque Chert
1342	B	V	Translucent Chert
1337	B	V	Opaque Chert
1371	B	IV	Quartzite
1387	B	IV	Quartzite
1414	B	IV	Quartzite
2107	A S½	VI	Translucent Chert
2112	A S½	III	Quartzite
2176	A S½	VI	Quartzite
2351	A S½	VI	Opaque Chert
2536	A S½	VI	Opaque Chert
2638	A S½	VI	Quartzite
2684	A S½	III	Translucent Chert
3194	A S½	III	Quartzite
4108	A N½	VI	Translucent Chert
4215	A N½	II	Opaque Chert
4245	A N½	III	Opaque Chert
4273	A N½	VI	Opaque Chert
4274	A N½	II	Whiskey Buttes Chert
4279	A N½	VI	Quartzite
4282	A N½	VI	Quartzite
4283	A N½	VI	Quartzite
4320	A N½	II	Opaque Chert
4380	A N½	III	Translucent Chert
4471	A N½	I	Translucent Chert
4502	A N½	II	Quartzite
4540	A N½	I	Quartzite
4573	A N½	III	Whiskey Buttes Chert
4583	A N½	I	Translucent Chert
4714	A N½	II	Whiskey Buttes Chert
4722	A N½	I	Opaque Chert
4816	A N½	II	Quartzite
4857	A N½	II	Translucent Chert
4984	A N½	I	Quartzite
5014	A N½	I	Quartzite
5039	A N½	I	Opaque Chert

Note: All catalog numbers have the prefix SCL14.

Table 7. Crosstabulation of utilized flakes by component and material type, Taliaferro site.

Component		Translucent Chert	Opaque Chert	Quartzite	Whiskey Buttes Chert	Obsidian	Total
		Material Type					
I	#	2	2	3	0	0	7
	Row %	28.6	28.6	42.9	0	0	11.9
	Column %	11.8	15.4	12.5	0	0	
	Total %	3.4	3.4	5.1	0	0	
II	#	1	2	2	2	0	7
	Row %	14.3	28.6	28.6	28.6	0	11.9
	Column %	5.9	15.4	8.3	50.0	0	
	Total %	1.7	3.4	3.4	3.4	0	
III	#	2	1	2	1	0	6
	Row %	33.3	16.7	33.3	16.7	0	10.2
	Column %	11.8	7.7	8.3	25.0	0	
	Total %	3.4	1.7	3.4	1.7	0	
IV	#	0	0	4	0	1	5
	Row %	0	0	80.0	0	20.0	8.5
	Column %	0	0	16.7	0	100.0	
	Total %	0	0	6.8	0	1.7	
V	#	6	1	2	1	0	10
	Row %	60.0	10.0	20.0	10.0	0	16.9
	Column %	35.3	7.7	8.3	25.0	0	
	Total #	10.2	1.7	3.4	1.7	0	
VI	#	2	3	5	0	0	10
	Row %	20.0	30.0	50.0	0	0	16.9
	Column %	11.8	23.1	20.8	0	0	
	Total %	3.4	5.1	8.5	0	0	
VII	#	4	4	6	0	0	14
	Row %	28.6	28.6	42.9	0	0	23.7
	Column %	23.5	30.8	25.0	0	0	
	Total %	6.8	6.8	10.2	0	0	
Total	#	17	13	24	4	1	59
	%	28.8	22.0	40.7	6.8	1.7	100.0

Retouched Flakes

Flakes removed from a nodule or core of raw material exhibiting retouch along one or more edges were grouped into the retouched flakes category. These artifacts are the result of intentional flaking to produce a desired edge suitable for use. Only flakes displaying obvious retouch, as evidenced by patterned flake scars to form the tool, are grouped in this class. Utilized flakes show no evidence of intentional flake removal to form the tool. It is important to note that this tool class is partly defined by the absence of facial thinning. This means that the modification is confined to the flake edges.

Fifty retouched flakes were recovered during the excavations at the Taliaferro site. These were grouped into types according to shape and location of edge retouch. Table 8 summarizes the characteristics of these

Table 8. Characteristics of retouched flakes by catalog number and type, Taliaferro site.

Catalog Number	Excavation Area	Component	Material Type	Area of Modification	Length (mm)	Width (mm)	Thickness (mm)	Edge Angle (Degrees)
Distal Retouch Flakes Type I								
4767	A N½	I	Quartzite	Distal, Notched	56.4	43.6	6.6	80
4810	A N½	I	Translucent Chert	Distal, Notched	37.4	32.7	6.7	85
5104	A N½	I	Translucent Chert	Distal, Notched	40.2	22.4	7.2	80
5149	A N½	I	Opaque Chert	Distal, Notched	39.8	35.5	7.3	85
5195	A N½	I	Opaque Chert	Distal, Notched	25.4	26.9	4.9	75
Distal Retouched Flakes Type II								
462	B	VII	Translucent Chert	Distal	35.1	21.4	7.3	80
684	B	VII	Opaque Chert	Distal	27.7	21.4	4.8	75
1395	B	IV	Translucent Chert	Distal, Lateral	42.3	31.3	7.8	80
2495	A S½	VI	Opaque Chert	Distal, Lateral	41.7	25.3	8.6	75
4639	A N½	I	Quartzite	Distal	37.1	37.0	8.4	55
4896	A N½	I	Whiskey Buttes Chert	Distal	31.2	36.6	4.8	60
5105	A N½	I	Opaque Chert	Distal	45.8	37.7	7.6	80
Distal Retouched Flakes Type III								
533	B	VII	Quartzite	Distal	60.2	45.4	12.5	55
701	B	V	Quartzite	Distal	54.0	45.1	14.4	70
4076	A N½	III	Quartzite	Distal	51.3	59.9	18.9	60
4250	A N½	II	Quartzite	Distal	-	26.7	7.9	80
5168	A N½	I	Quartzite	Distal, Lateral	70.9	57.5	13.6	70
Lateral Retouched Flakes Type I								
456	B	VII	Translucent Chert	Lateral	-	32.6	6.4	60
508	B	V	Quartzite	Lateral	54.3	46.4	7.6	55
2738	A S½	VI	Translucent Chert	Distal, Lateral	50.0	23.4	7.3	60

Table 8. Continued.

Catalog Number	Excavation Area	Component	Material Type	Area of Modification	Length (mm)	Width (mm)	Thickness (mm)	Edge Angle (Degrees)
				Lateral Retouched Flakes Type I (continued)				
3166	A S½	III	Translucent Chert	Lateral	-	20.4	5.5	60
3175	A S½	III	Opaque Chert	Lateral	53.0	56.9	9.8	55
4267	A N½	II	Quartzite	Lateral	58.0	46.8	7.7	60
4828	A N½	I	Quartzite	Proximal, Lateral	51.0	33.7	11.7	55
5106	A N½	I	Translucent Chert	Lateral	44.2	27.8	5.7	45
				Lateral Retouched Flakes Type II				
763	B	IV	Translucent Chert	Lateral	37.1	14.5	7.0	25
2098	A S½	VI	Opaque Chert	Lateral, Both	33.9	16.8	2.6	25
2706	A S½	VI	Whiskey Buttes Chert	Lateral, Both	52.0	21.6	4.6	50
3099	A S½	VI	Translucent Chert	Lateral	-	16.5	3.4	30
5180	A N½	I	Opaque Chert	Lateral, Both	31.4	17.8	3.1	45
				Serrated Flake				
334	B	VII	Translucent Chert	Lateral	21.9	12.9	2.3	-
				Notched Flakes				
2352	A S½	VI	Whiskey Buttes Chert	Lateral	22.4	17.5	3.6	-
4303	A N¼	II	Opaque Chert	Lateral	20.4	19.7	3.7	-
4536	A N½	I	Opaque Chert	Lateral	45.6	33.9	8.8	-

Table 8. Concluded.

Catalog Number	Excavation Area	Component	Material Type	Area of Modification	Length (mm)	Width (mm)	Thickness (mm)	Edge Angle (Degrees)
Gravers								
1031	B	VII	Quartzite	Lateral	37.6	26.8	7.8	-
2148	A S½	VI	Opaque Chert	Lateral	46.9	31.9	6.0	-
3007	A S½	VI	Translucent Chert	Lateral	29.9	26.8	5.9	-
4719	A N½	I	Whiskey Buttes Chert	Distal	70.0	20.1	5.6	-
Irregular Retouched Flakes								
423	B	V	Obsidian	Lateral	22.1	17.6	4.5	-
660	B	V	Translucent Chert	Lateral	49.1	33.4	4.9	-
874	B	VII	Obsidian	Lateral	20.4	18.7	4.8	-
936	B	V	Opaque Chert	Lateral	32.8	17.2	5.4	-
1190	B	V	Translucent Chert	Distal	23.9	16.4	3.1	-
2676	A S½	VI	Quartzite	Lateral	68.2	36.9	9.9	-
3178	A S½	I	Opaque Chert	Lateral	41.6	27.8	9.8	-
4064	A N½	III	Opaque Chert	Lateral	64.7	34.9	9.9	-
4177	A N½	II	Whiskey Buttes Chert	Lateral	-	31.9	5.7	-
4228	A N½	III	Quartzite	Distal	128.4	54.4	17.8	-
4354	A N½	III	Quartzite	Lateral	68.1	47.8	12.8	-
4921	A N½	I	Quartzite	Lateral	60.2	35.3	10.7	-

Note: All catalog numbers have the prefix SLC14.

tools by type and catalog number. Types include 17 distal retouched, 13 lateral retouched, one serrated, three notched, four gravers, and 12 irregular retouched flakes. The distal and lateral retouched flakes were further divided based on presence or absence of obvious notches for hafting and size.

Table 9 details the mean, standard deviation, and variance of the length, width, and thickness broken down by distal retouched flake Types I, II, and III and lateral retouched flake Types I and II. The Kruskal-Wallis one-way analysis of varinace test was used to show that signifiant differences occur between these types. The null hypothesis was that the size between types are the same to be rejected at the .05 alpha level. For the length measurements, the H value was 13.706 significant at the .008 level; for the width, it was 14.552 significant at the .006 level; and for the thickness, it was 17.450 significant at the .002 level. The null hypothesis can be rejected for the three measurements indicating significant differences exist in the size of the these artifact types.

The crosstabulation of all retouched flakes by material type and component is detailed in Table 10. The dominant material types are almost equally distributed among quartzite, translucent chert, and opaque algalitic chert. Whiskey Buttes chert and obsidian occur in smaller quantities. The chi-square test was used to determine if significant differences in material types are present between the components and was conducted under the null hypothesis of no difference (rejection at the .05 alpha level). The computed chi-square value was 21.49 with 24 degrees of freedom significant at the .6091 level. There were no significant differences in material types in relation to the components.

Table 11 provides the distribution of the various retouched flake types by component. Component I contains the most at 16 specimens or 32.0% of the total. The Late Prehistoric Component IV has only two flakes, and the other Late Prehistoric components have between six and nine each. This table will be referred to during the brief descriptions of each type below.

Distal Retouched Flakes

Seventeen flakes from the Taliaferro site display unifacial retouch along the distal margin. Though the working edge of these flakes are along the distal end, some also display evidence of retouch for notching or shaping on the lateral edges (Table 8). These artifacts are described often in the archaeological literature with the functional term "end scrapers." Using the presence or absence of obvious notches for halfing and overall size, they were grouped into Types I, II, and III.

Type I: Hafted Distal Retouched Flakes

Five specimens from the collection display obvious notches for hafting (Figure 4, a-d). All belong to the Early Archaic Component I of the north half of Excavation Area A and have edge angles ranging from 75 to 85 degrees (Tables 8 and 11). The steep edge angles are probably the result of continued resharping until they were rejected. Material types include two each of translucent and opaque algalitic chert and one of quartzite. The mean and standard deviation of their length, width, and thickness is provided in Table 9.

Type II: Small Distal Retouched Flakes

Seven distal retouched flakes are included in the Type II category (Figure 4, e-h). They are similar in size to the Type I flakes but lack obvious notches (Table 9); however, some (SCL14.1395 and 2495) have lateral

Table 9. The mean, standard deviation, and variance of the length, width, and thickness of distal and lateral retouched flakes by type, Taliaferro site.

	Distal Retouched			Lateral Retouched		
	Type I	Type II	Type III	Type I	Type II	Total
			Length (mm)			
Number	5	7	4	6	4	26
Mean	39.8	37.6	59.1	51.7	38.6	44.6
Standard Deviation	11.0	6.4	8.7	4.6	9.2	11.1
Variance	122.2	41.8	75.7	21.5	85.2	124.4
			Width (mm)			
Number	5	7	5	8	5	30
Mean	32.2	30.1	46.9	36.0	17.4	32.7
Standard Deviation	8.1	7.3	13.1	12.8	2.6	12.8
Variance	66.3	53.9	173.7	163.9	6.8	164.4
			Thickness (mm)			
Number	5	7	5	8	5	30
Mean	6.5	7.0	13.4	7.7	4.1	7.7
Standard Deviation	0.9	1.5	3.9	2.1	1.7	3.5
Variance	0.9	2.5	15.5	4.4	3.0	12.5

retouch from shaping, possibly for creating suitable edges for hafting. Edge angles of the distal margins range from 55 to 80 degrees (Table 8). The steeper ones were probably resharpened until spent and then discarded. The others probably represent the orginal angle of these artifacts, and they were rejected most likely due to breakage during manufacture. Three are from Component I, one each is from Components IV and VI, and the remaining two are from Component VII (Table 11). Material types include three of opaque algalitic chert, two of translucent algalitic chert, and one each of quartzite and Whiskey Buttes chert.

Type III: Large Distal Retouched Flakes

Five distal retouched flakes are grouped into this type because they are much larger than the other two types as is evident by the means listed in Table 9 (Figure 5, a-b). All are of quartzite and have edge angles ranging between 55 and 80 degrees (Table 8). Again, the steeper ones probably were resharpened to where they were no longer useful and then rejected. One each is from Components I, II, III, V, and VII. The large specimen from Component I (SCL14.5168), in addition to the distal end, displays retouch for backing along one lateral edge.

Lateral Retouched Flakes

Thirteen artifacts exhibit unifacial retouch on at least one lateral edge, which was the working portion of the implement. Distal or proximal retouch on some were for producing a backed tool (Table 8). This category includes what is often referred to as "side scrapers." Those recovered from the Taliaferro site are divided into Types I and II using shape of margin,

Table 10. Crosstabulation of retouched flakes by component and material type, Taliaferro site.

Component		Translucent Chert	Opaque Chert	Quartzite	Whiskey Buttes Chert	Obsidian	Total
		Material Type					
I	#	3	6	5	2	0	16
	Row %	18.8	37.5	31.3	12.5	0	32.0
	Column %	21.4	42.9	33.3	40.0	0	
	Total %	6.0	12.0	10.0	4.0	0	
II	#	0	1	2	1	0	4
	Row %	0	25.0	50.0	25.0	0	8.0
	Column %	0	7.1	13.3	20.0	0	
	Total %	0	2.0	4.0	2.0	0	
III	#	1	2	3	0	0	6
	Row %	16.7	33.3	50.0	0	0	12.0
	Column %	7.1	14.3	20.0	0	0	
	Total %	2.0	4.0	6.0	0	0	
IV	#	2	0	0	0	0	2
	Row %	100.0	0	0	0	0	4.0
	Column %	14.3	0	0	0	0	
	Total %	4.0	0	0	0	0	
V	#	2	1	2	0	1	6
	Row %	33.3	16.7	33.3	0	16.7	12.0
	Column %	14.3	7.1	13.3	0	50.0	
	Total %	4.0	2.0	4.0	0	2.0	
VI	#	3	3	1	2	0	9
	Row %	33.3	33.3	11.1	22.2	0	18.0
	Column %	21.4	21.4	6.7	40.0	0	
	Total %	6.0	6.0	2.0	4.0	0	
VII	#	3	1	2	0	1	7
	Row %	42.9	14.3	28.6	0	14.3	14.0
	Column %	21.4	7.1	13.3	0	50.0	
	Total %	6.0	2.0	4.0	0	2.0	
Total	#	14	14	15	5	2	50
	%	28.0	28.0	30.0	10.0	4.0	100.0

size, and edge angle to distinguish type. The edge of these artifacts is more acute than the distal retouched flakes.

Type I: Large Lateral Retouched Flakes

The eight specimens classified as Type I lateral retouched flakes have a straight margin along the working edge and edge angles ranging from 45 to 60 degrees (Table 8, Figure 6, a-d). They are generally larger than those grouped into the Type II category (Table 9). Except for Component IV, at least one was found in each component. Material types include four of translucent algalitic chert, three of quartzite, and one of opaque algalitic chert. Two specimens (SCL14.2738 and 4828) are backed on the distal or proximal end.

Table 11. Crosstabulation of retouched flake types by component, Taliaferro site.

Component		Retouched Flake Type									
		Distal Retouched Type I	Distal Retouched Type II	Distal Retouched Type III	Lateral Retouched Type I	Lateral Retouched Type II	Serrated	Notched	Gravers	Irregular Retouched	Total
I	#	5	3	1	2	1	0	1	1	2	16
	Row %	31.3	18.8	6.3	12.5	6.3	0	6.3	6.3	12.5	32.0
	Column %	100.0	42.9	20.0	25.0	20.0	0	33.3	25.0	16.7	
	Total %	10.0	6.0	2.0	4.0	2.0	0	2.0	2.0	4.0	
II	#	0	0	1	1	0	0	1	0	1	4
	Row %	0	0	25.0	25.0	0	0	25.0	0	25.0	8.0
	Column %	0	0	20.0	12.5	0	0	33.3	0	8.3	
	Total %	0	0	2.0	2.0	0	0	2.0	0	2.0	
III	#	0	0	1	2	0	0	0	0	3	6
	Row %	0	0	16.7	33.3	0	0	0	0	50.0	12.0
	Column %	0	0	20.0	25.0	0	0	0	0	25.0	
	Total %	0	0	2.0	4.0	0	0	0	0	6.0	
IV	#	0	1	0	0	1	0	0	0	0	2
	Row %	0	50.0	0	0	50.0	0	0	0	0	4.0
	Column %	0	14.3	0	0	20.0	0	0	0	0	
	Total %	0	2.0	0	0	2.0	0	0	0	0	
V	#	0	0	1	1	0	0	0	0	4	6
	Row %	0	0	16.7	16.7	0	0	0	0	66.7	12.0
	Column %	0	0	20.0	12.5	0	0	0	0	33.3	
	Total %	0	0	2.0	2.0	0	0	0	0	8.0	
VI	#	0	1	0	1	3	0	1	2	1	9
	Row %	0	11.1	0	11.1	33.3	0	11.1	22.2	11.1	18.0
	Column %	0	14.3	0	12.5	60.0	0	33.3	50.0	8.3	
	Total %	0	2.0	0	2.0	6.0	0	2.0	4.0	2.0	
VII	#	0	2	1	1	0	1	0	1	1	7
	Row %	0	28.6	14.3	14.3	0	14.3	0	14.3	14.3	14.0
	Column %	0	28.6	20.0	12.5	0	100.0	0	25.0	8.3	
	Total %	0	4.0	2.0	2.0	0	2.0	0	2.0	2.0	
Total	#	5	7	5	8	5	1	3	4	12	50
	%	10.0	14.0	10.0	16.0	10.0	2.0	6.0	8.0	24.0	100.0

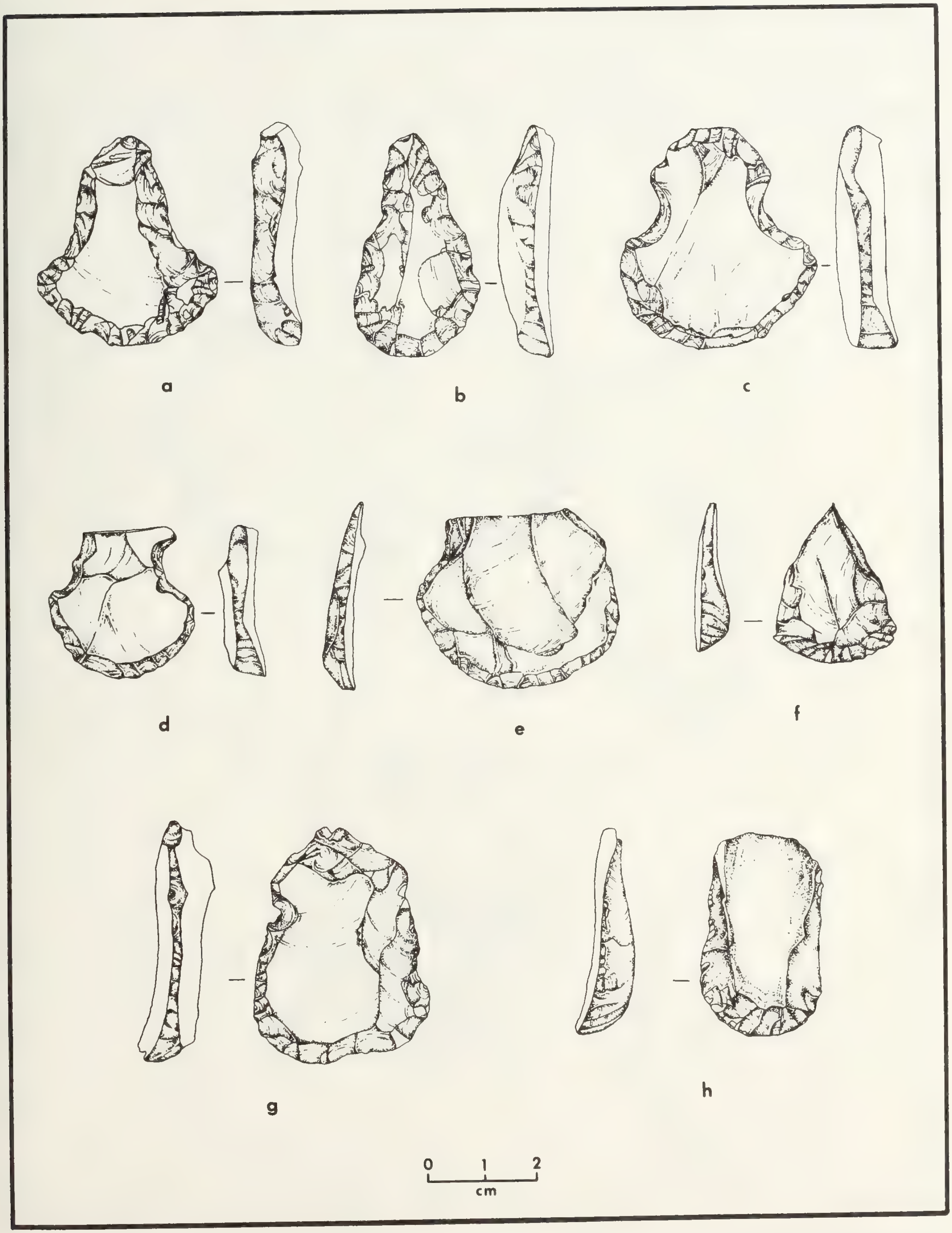


Figure 4. Selected distal retouched flakes, Type I and II, from the Taliaferro site. a-d, Type I; e-h, Type II. Provenience: Component I, a. SCL14.4810, b. SCL14.5104, c. SCL14.5149, d. SCL14.5195, e. SCL14.4896; Component IV, g. SCL14.1395; Component VII, f. SCL14.684, h. SCL14.462.

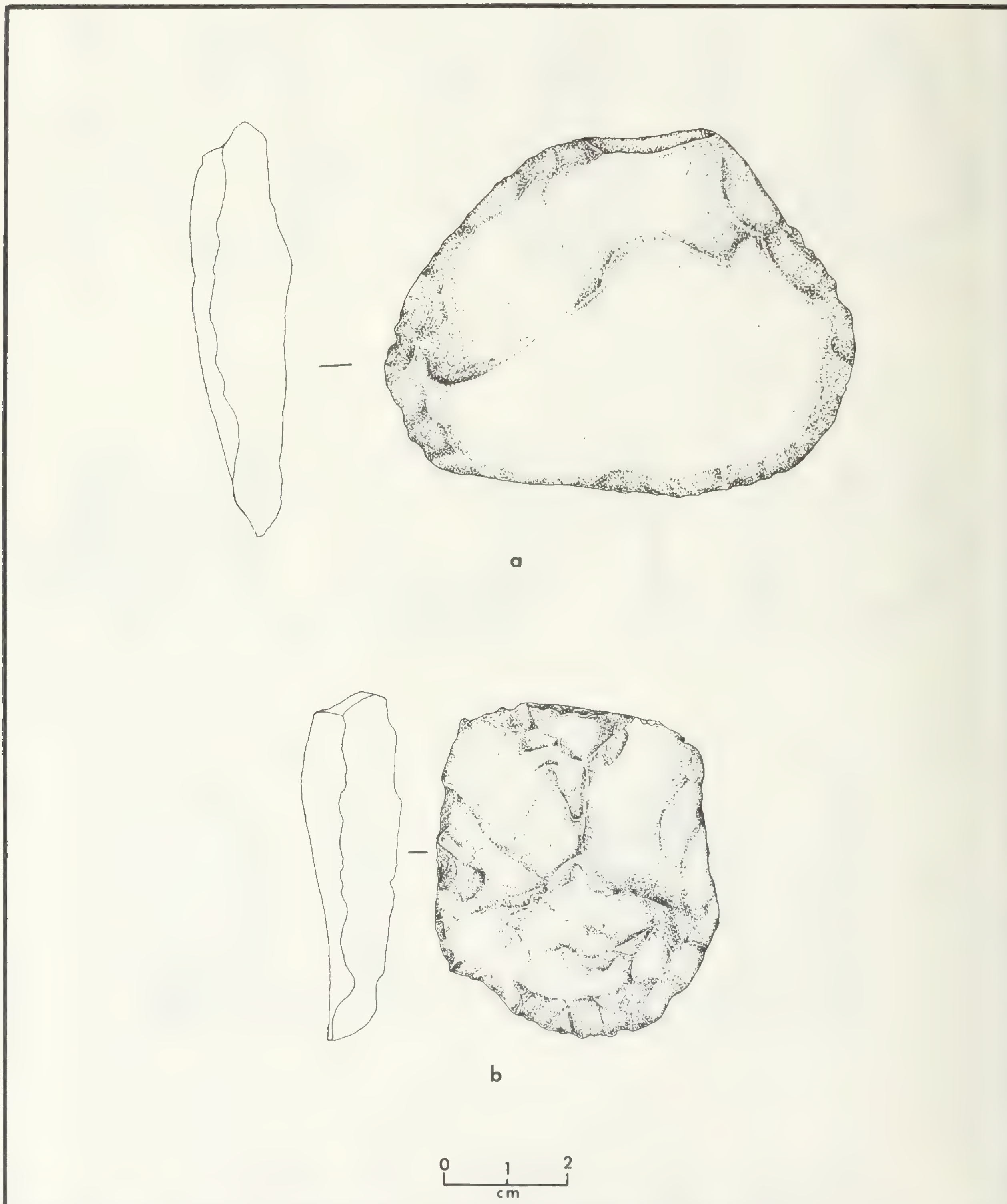


Figure 5. Selected distal retouched flakes, Type III, from the Taliaferro site. Provenience: Component I, a. SCL14.5168; Component V, b. SCL14.701.

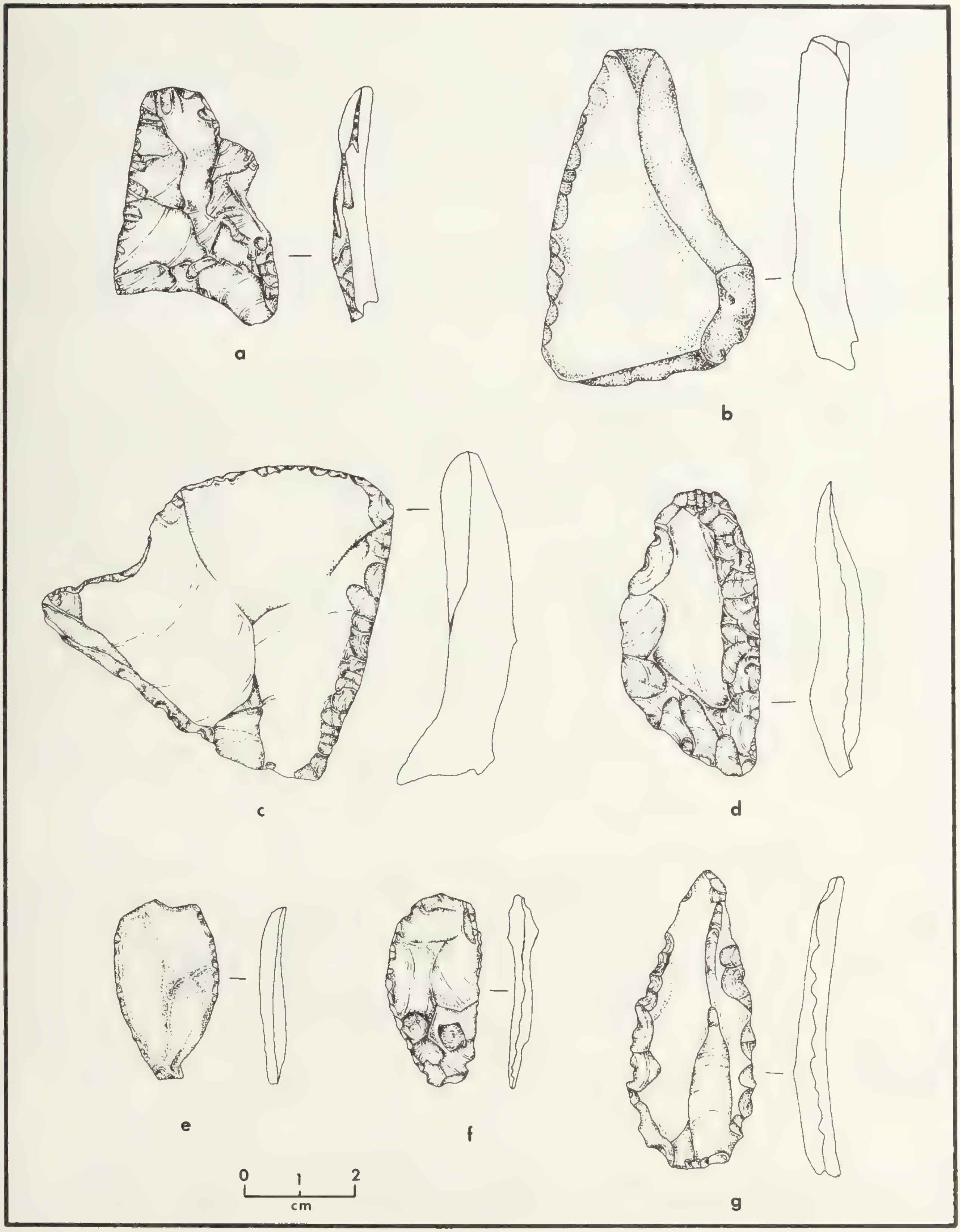


Figure 6. Selected lateral retouched flakes from the Taliaferro site. A-d, Type I; e-g, Type II. Provenience: Component I, a. SCL14.5106, e. SCL14.5180; Component II, b. SCL14.4267; Component III, c. SCL14.3175; Component VI, d. SCL14.2738, f. SCL14.2098, g. SCL14.2706.

Type II: Small Lateral Retouched Flakes

The remaining five lateral retouched flakes are grouped into the Type II category (Figure 6, e-g). They have more curved margins and are generally smaller than the Type I specimens (Table 9). The edge angles, ranging between 25 and 50 degrees, are more acute than those of Type I. Two each are of translucent and opaque algalitic chert and one is of Whiskey Buttes chert. Three are associated with Component VI and one each with Components I and IV (Table 11).

Serrated Flake

One flake with serrated, unifacial retouch along one margin was recovered from Component VII (Chapter 4, Figure 70). The retouch consists of a series of regularly spaced projections, or teeth. It is of translucent alaglitic chert and measures 21.9 x 12.9 x 2.3 mm (Table 8).

Notched Flakes

Three flakes contain small notches created by unifacial retouch on one of their lateral edges (Chapter 4, Figures 22, 29, and 62). The width of the notch openings range from 7 to 12 mm. The flakes are between 22.5 and 45.6 mm in length and 17.5 to 33.9 mm in width (Table 8). Material types include two of opaque algalitic chert and one of Whiskey Buttes chert. They are distributed among Components I, II, and VI.

Gravers

Four flakes in the collection that exhibit pronounced projections were classified as gravers (Figure 7, a-c). These projections are bifacially or unifacially flaked and are up to 25 mm long. In contrast to drills, which are produced from the final shaping of bifaces, these artifacts result from the retouching of flakes. The use of the term graver for this category does not necessarily imply function. The size of the flakes on which the four gravers were manufactured varies greatly from 29.9 to 70.0 mm in length (Table 8). One is from Component I, two are from Component VI, and another is from Component VII (Table 11). Material types include one each of Whiskey Buttes chert, translucent and opaque algalitic chert, and quartzite.

Irregular Retouch Flakes

The remaining 12 retouched flakes were included as irregular retouch flakes. These flakes contain obvious unifacial retouch along a portion of the margin of a lateral or distal edge and probably were rejected before completion during maufacture. Those used as the intended implement are considered as expedient tools in contrast to the more modified or formal retouched flakes in the collection. Except for Component IV, each component has at least one. It is the most common retouched flake type in Component III with three specimens and in Component V with four (Table 11). Four are of quartzite, three are of opaque algalitic chert, two each are of translucent algalitic chert and obsidian, and one is of Whiskey Buttes chert.

Modified Cobbles and Pebbles

In addition to artifacts resulting from the reduction of bifaces and flakes, another manufacturing sequence present at the site included the expedient modification of cobbles and pebbles. These tools exhibit bifacial flaking along one or more edges and, in contrast to artifacts in the bifacial reduction sequence, flake scars extend less than halfway across the cobble or

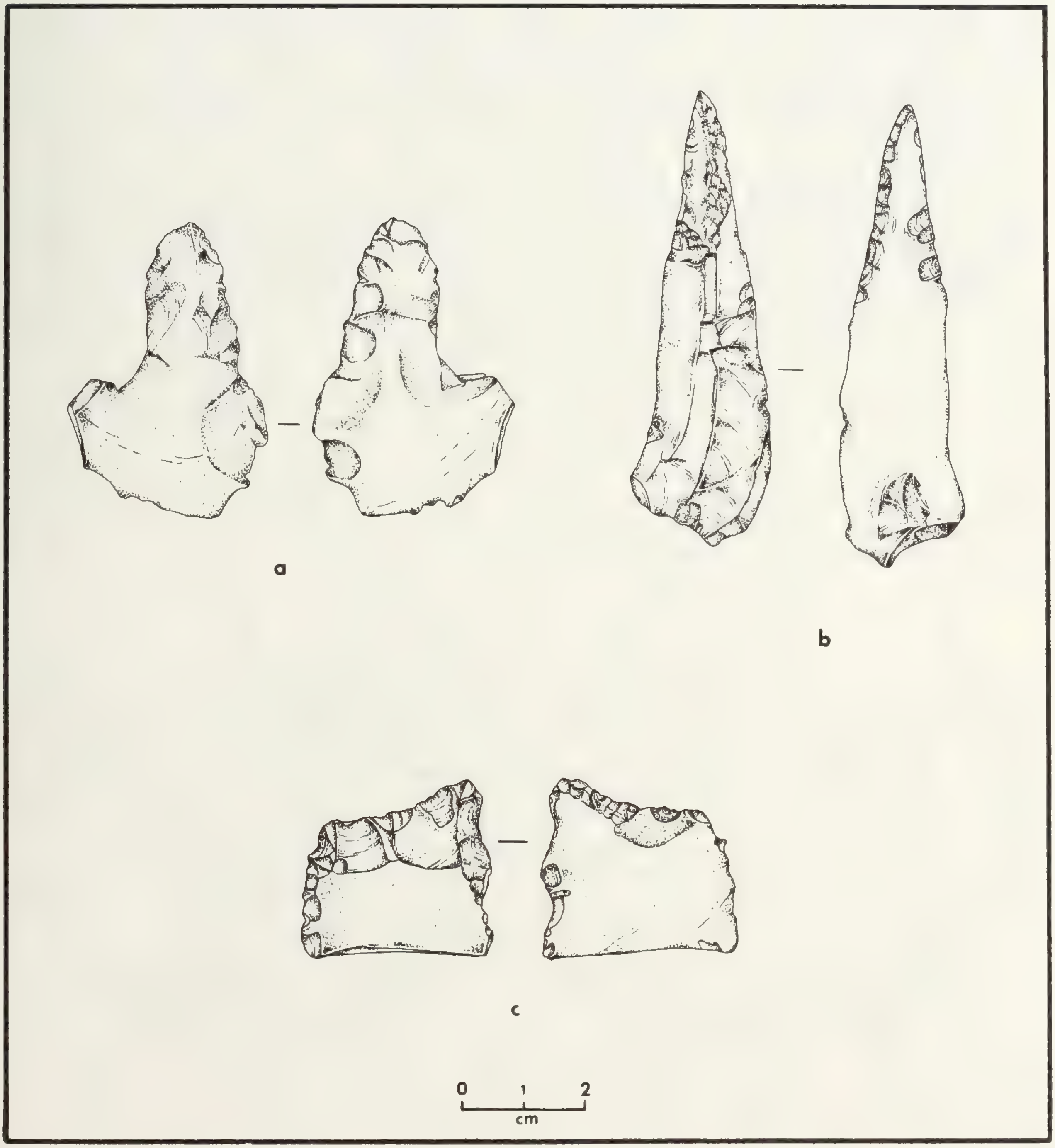


Figure 7. Selected gravers from the Taliaferro site. Provenience: Component VI, a. SCL14.2148, c. SCL14.3007; Component I, b. SCL14.4719.

pebble face (Figures 8 and 9). Most exhibit evidence of chopping or battering along the modified edge.

Seventeen modified cobbles or pebbles were recovered from the site; four were from the south half of Excavation Area A, six were from the north half of Area A, and seven were from Area B. Table 12 summerizes their characteristics, including material type, condition, measurements, and area of modification by catalog number. All were of quartzite and, except for one from Component VII, were complete. Area of modification includes both sides and an end, one side and an end, one side, or an end. One modified cobble (SCL14.4911) from Component I has flaking around the entire margin. Four were associted with Component I, two with Component II, one with Component III, two with Component IV, one with Component V, three with Componet VI, and four with Component VII.

The mean, standard deviation, and variance of the length, width, and thickness of the modified cobbles or pebbles were computed by component (Table 13). To examine if differences in the size of these artifacts exist between the components, the Kruskal-Wallis one-way analysis of variance was used. The test was performed under the null hypothesis of no differences in the length, width, and thickness measurements to be rejected at the .05 alpha level. The H value for the length was 10.015 significant at the .124 level; for the width, it was 12.566 significant at the .050; and for the thickness, it was 11.317 significant at the .079 level. The null hypothesis can only be rejected for the width measurements, which indicates only slight differences in the size of the tools between components. Though not statistically significant, the means for the length, width, and thickness appear to be larger for the Archaic components than for the Late Prehistoric ones; however, relatively large quartzite cobbles or pebbles were chosen for the manufacture of all tools in this category regardless of component.

Preblanks

Bifacially flaked stone artifacts grouped into the preblanks category belong to the first stage within the reduction continuum of bifacial stone tool manufacture. Preblanks are thick and blocky in cross section and display much of the shape and form of the orginal cobble or pebble. They often lack flaking around their entire margin. Many may have functioned as cores but are separated from that category by having a discoidal shape and two definite faces. Most exhibit cortex on at least one side, except in a few instances when a preblank was used as a special implement. Though preblanks could have served as a tool, most recovered from the Taliaferro site appear to have been discarded due to breakage or because they contained defects in the material which rendered them unsuitable for further reduction.

A total of 131 preblanks was recovered from the Taliaferro site, and of these, 107 are complete (Figure 10 a-f). Forty-four were from the north half of Excavation Area A, 39 were from the south half of Area A, and the remaining 48 were found in Area B. Table 14 lists the characteristics, including material type, condition, and measurements, of each of these bifaces by catalog number. Because preblanks are irregular in outline, fragments are noted as either terminal or midsection, and the shape of the complete preblanks are not given on the table. The width of the fragments was taken at the widest point on the remaining portion, and in most instances this was probably the broadest area of the complete artifact before breakage. No measurements are given for small fragments.

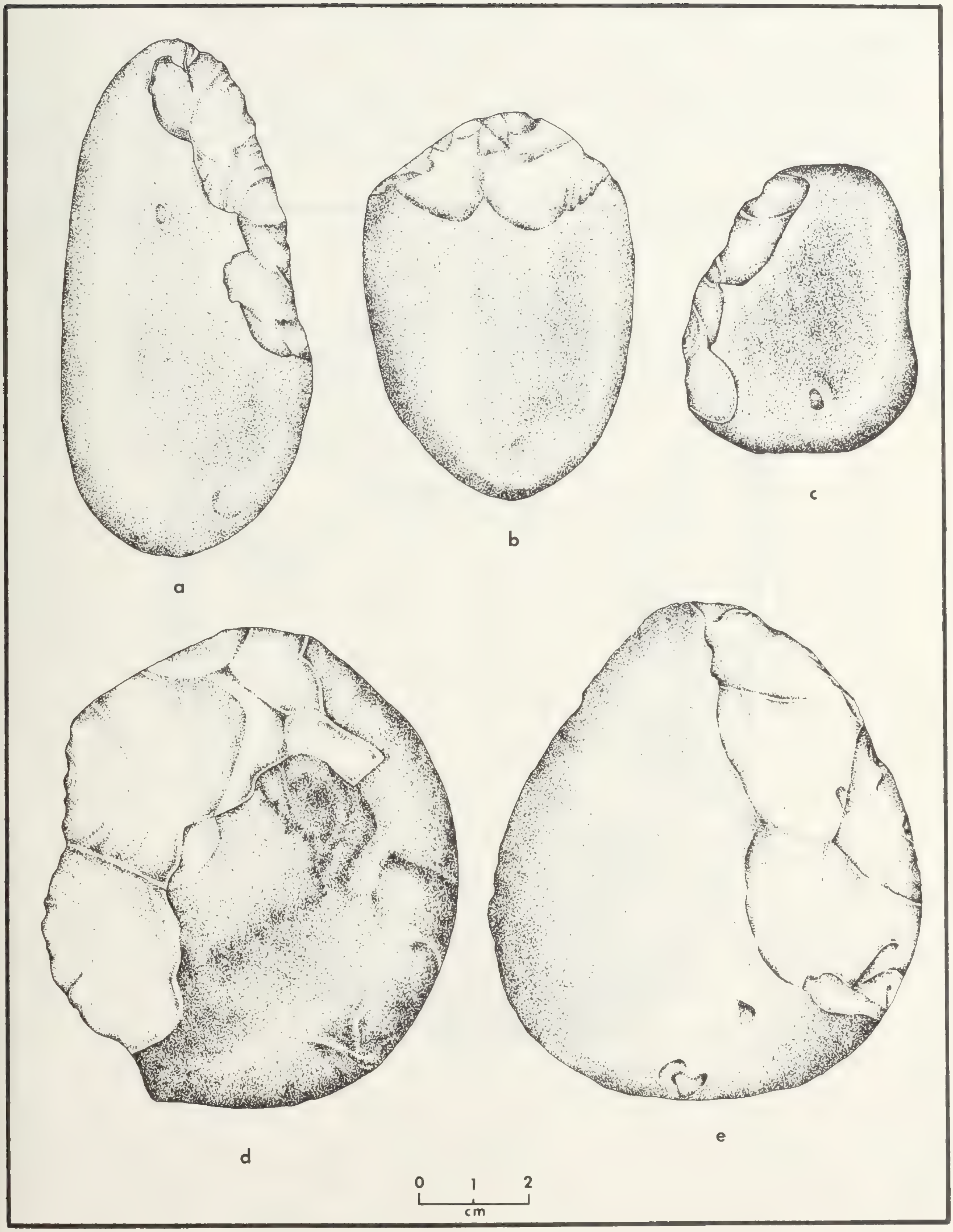


Figure 8. Selected modified cobbles and pebbles from the Taliaferro site. Provenience: Component IV, b. SCL14.1116; c. SCL14.1115; Component VI, d. SCL14.3003; e. SCL14.2696; Component VII, a. SCL14.501.

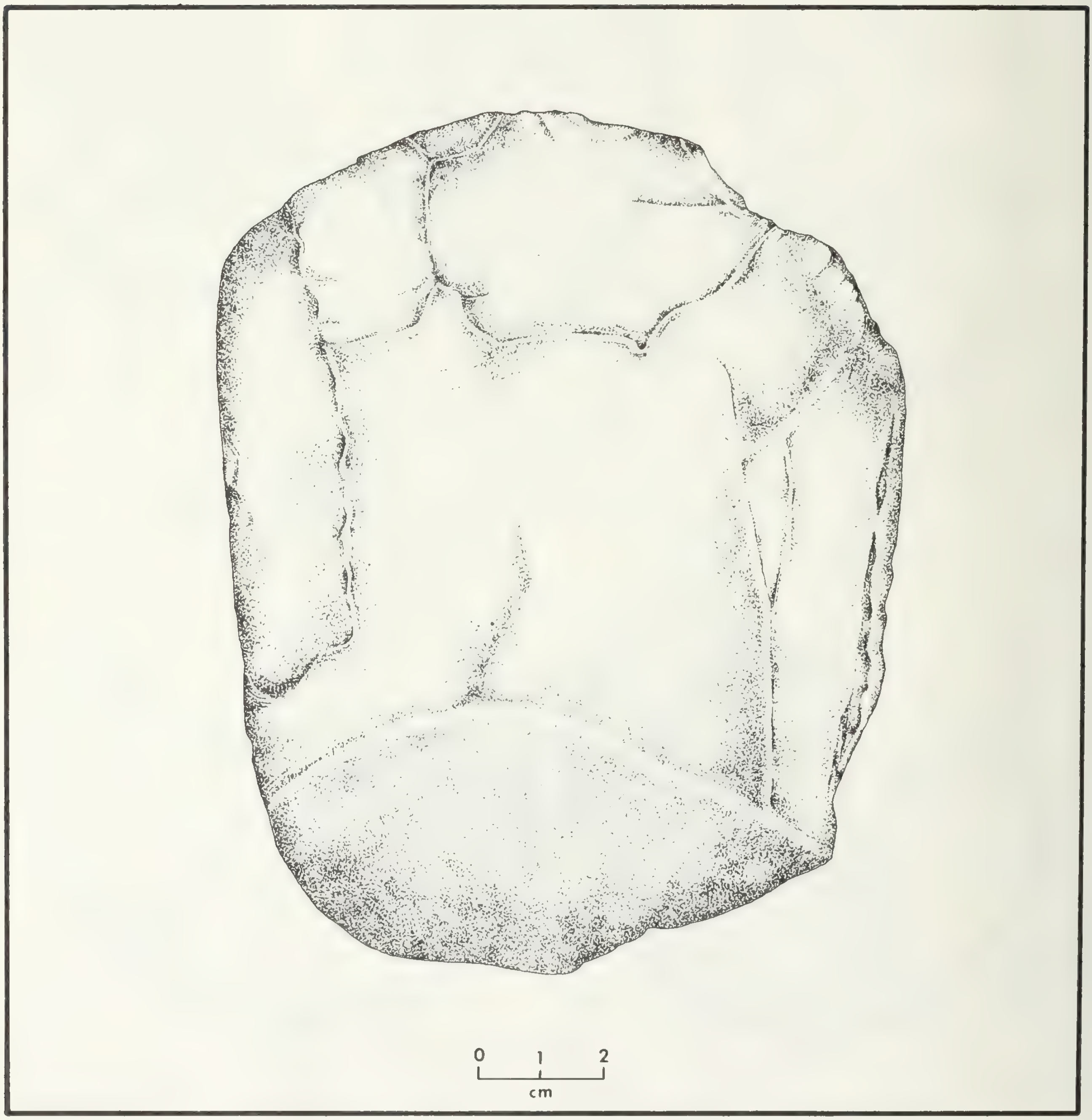


Figure 9. Selected modified cobble from the Taliaferro site. Provenience: Component I, SCL14.4979.

Table 12. Characteristics of modified cobbles and pebbles by catalog number, Taliferro site.

Catalog Number	Excavation Area	Component	Material Type	Condition	Length (mm)	Width (mm)	Thickness (mm)	Area of Modification
257	B	VII	Quartzite	Complete	70.9	45.0	18.0	Sides, end
305	B	VII	Quartzite	Terminal	-	-	29.6	Unknown
483	B	VII	Quartzite	Complete	60.7	48.7	20.9	Sides, end
501	B	VII	Quartzite	Complete	89.6	43.1	17.6	Side, end
1115	B	IV	Quartzite	Complete	49.0	41.2	11.4	Side
1116	B	IV	Quartzite	Complete	67.4	46.9	18.4	End
1192	B	V	Quartzite	Complete	56.4	50.7	27.3	Side
2554	A S½	VI	Quartzite	Complete	45.0	47.2	20.8	End
2696	A S½	VI	Quartzite	Complete	85.9	76.0	33.4	End
3003	A S½	VI	Quartzite	Complete	84.4	74.7	30.6	Side, end
3161	A S½	III	Quartzite	Complete	112.4	76.9	21.4	End
4268	A N½	II	Quartzite	Complete	60.8	58.1	44.4	Sides, end
4503	A N½	II	Quartzite	Complete	111.4	95.5	40.6	Side
4774	A N½	II	Quartzite	Complete	118.2	99.6	32.9	End
4806	A N½	I	Quartzite	Complete	107.8	94.4	51.0	Side, end
4911	A N½	I	Quartzite	Complete	101.7	81.7	27.9	Entire margin
4979	A N½	I	Quartzite	Complete	134.5	102.9	55.5	Unknown

Note: All catalog numbers have the prefix SCL14.

One quartzite preblank (SCL14.2118) from Component IV of the south half of Excavation Area A is an unusal tool for this artifact class (Chapter 4, Figure 441). One edge and part of another has been bifacially reduced while the other sides exhibit the original shape of the cobble. The reduced margins also display fine, bifacial retouch and hinge fractures, probably resulting from use as a small chopping tool.

Translucent algalitic chert is the most common material type represented in the collection at 63 specimens or 48.1% of the total. Other materials include 33 specimens of opaque algalitic chert, 26 of quartzite, 2 of moss agate, 6 of Whiskey Buttes chert, and 1 of obsidian (Table 15). Table 15 also shows the preblanks broken down by component and material type. The Early Archaic Component I yielded a total of 30 preblanks with 53.3% of translucent algalitic chert and another 23.3% of quartzite. The remaining specimens are distributed among opaque algalitic chert, moss agate, and Whiskey Buttes chert. Only ten preblanks were found in the Middle Archaic Component II. The material types in order of dominance are opaque algalitic chert, quartzite,

Table 13. The mean, standard deviation, and variance of the length, width, and thickness of modified cobbles or pebbles by component, Taliaferro site.

	Component I	II	III	IV	V	VI	VII	Total
Length (mm)								
Number	4	2	1	2	1	3	3	16
Mean	115.5	86.1	112.4	58.2	56.4	71.7	73.7	84.7
Standard Deviation	14.3	35.7	0	13.0	0	23.1	14.6	27.3
Variance	206.0	1280.1	0	169.2	0	537.9	214.8	747.9
Width (mm)								
Number	4	2	1	2	1	3	3	16
Mean	94.6	76.8	76.9	44.0	50.7	65.9	45.6	67.6
Standard Deviation	9.3	26.4	0	4.0	0	16.2	2.8	22.8
Variance	86.7	699.3	0	16.2	0	264.5	8.1	503.9
Thickness (mm)								
Number	4	2	1	2	1	3	4	17
Mean	41.8	42.5	21.4	14.9	27.3	28.2	21.5	29.5
Standard Deviation	13.4	2.6	0	4.9	0	6.6	5.5	12.3
Variance	181.5	7.2	0	24.5	0	43.7	31.2	153.6

translucent algalitic chert, and Whiskey Buttes chert. Component III, dating to the Late Archaic, produced 16 preforms with 50.0% of translucent algalitic chert. Of the Archaic components, Components I and III are the most similar in that at least half of the preblanks are of translucent algalitic chert while Component II has a greater percentage of opaque algalitic chert and quartzite.

The remaining 75 preblanks are distributed among four Late Prehistoric Components IV-VII. Five are from Component IV, 15 from Component V, 27 from Component VI, and 28 from Component VII (Table 15). Translucent algalitic chert is the dominant material type in Components V and VII with 10 and 16 respectively. Component IV has two specimens of quartzite and one each of opaque algalitic chert, translucent algalitic chert, and obsidian. Material types represented in Component VI include opaque algalitic chert (12), translucent algalitic chert (10), quartzite (3), moss agate (1), and Whiskey Buttes chert (1). Except for Component IV which has a small sample of only five preblanks, translucent and opaque algalitic chert dominate in the Late Prehistoric components.

To examine if significant differences exist in the raw material types used in the production of preblanks in the three Archaic periods and the Late Prehistoric, the chi-square test was used. The data for the four Late Prehistoric components were combined for this test, which was performed under the null hypothesis of no difference between the material types with respect to the cultural components (alpha = .05). The chi-square was computed at 15.08 with 15 degrees of freedom significant at the .4450 level with the Cramer's V calculated at .19595. Given these figures, no significant differences in the material types of preblanks occur between the components.

The mean, standard deviation, and variance of the length, width, and thickness of the preblanks were calculated for each component (Table 16). The

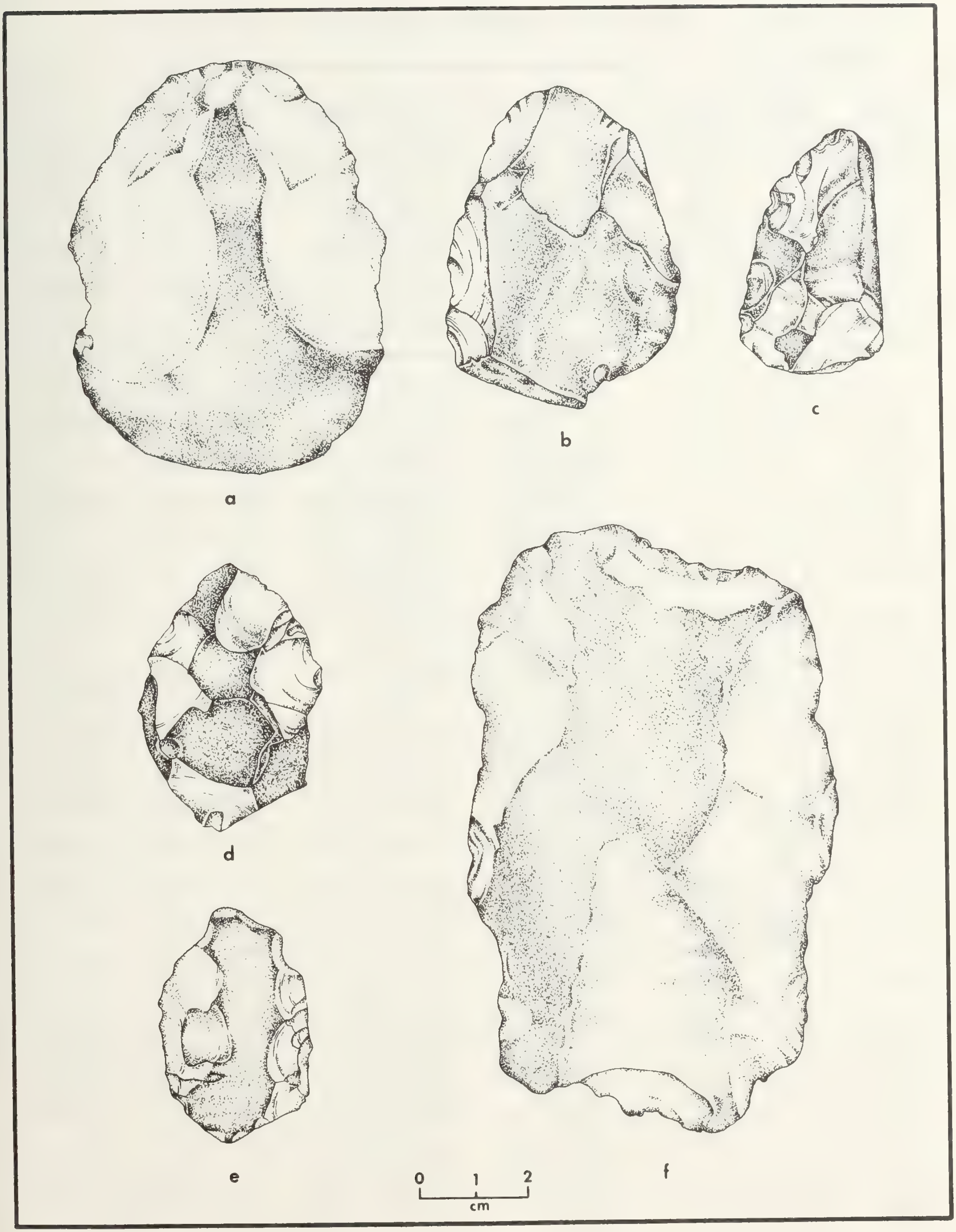


Figure 10. Selected preblanks from the Taliaferro site. Provenience: Component I, f. SCL14.4539; Component III, e. SCL14.3024; Component V, b. SCL14.1272; Component VI, a. SCL14.2737, c. SCL14.2734, d. SCL14.2962.

Table 14. Characteristics of preblanks by catalog number, Taliaferro site.

Catalog Number	Excavation Area	Component	Material Type	Condition	Length (mm)	Width (mm)	Thickness (mm)	Cortex
236	B	VII	Translucent Chert	Complete	47.7	37.8	18.8	Present
262	B	VII	Translucent Chert	Terminal	-	27.1	8.2	Absent
263	B	VII	Translucent Chert	Complete	36.2	25.1	8.2	Absent
303	B	VII	Translucent Chert	Complete	47.3	33.2	24.4	Present
317	B	VII	Translucent Chert	Complete	44.3	29.2	9.8	Present
318	B	VII	Translucent Chert	Complete	35.4	23.8	11.9	Present
335	B	VII	Translucent Chert	Complete	30.9	26.1	12.5	Present
341	B	VII	Translucent Chert	Complete	44.6	23.6	14.4	Present
361	B	VII	Translucent Chert	Complete	47.2	27.1	15.5	Absent
419	B	V	Opaque Chert	Complete	57.7	27.1	11.9	Present
420	B	VII	Translucent Chert	Complete	38.8	25.9	15.7	Present
422	B	VII	Translucent Chert	Complete	31.7	20.9	8.6	Present
424	B	VII	Translucent Chert	Complete	43.4	22.3	15.9	Present
452	B	VII	Opaque Chert	Complete	53.2	36.3	17.0	Present
493	B	VII	Translucent Chert	Terminal	-	26.2	5.5	Present
498	B	VII	Quartzite	Complete	52.8	44.7	22.6	Present
515	B	VII	Translucent Chert	Terminal	-	23.4	10.5	Present
565	B	VII	Opaque Chert	Complete	32.3	21.9	6.6	Present
566	B	VII	Translucent Chert	Complete	36.3	22.9	10.1	Present
567	B	VII	Quartzite	Complete	52.3	30.4	12.5	Absent
571	B	VII	Opaque Chert	Complete	23.9	18.5	10.1	Present
651	B	VII	Translucent Chert	Terminal	-	25.7	9.8	Present
669	B	V	Translucent Chert	Complete	57.7	31.4	12.1	Present
675	B	V	Translucent Chert	Complete	49.6	33.9	15.6	Present
702	B	V	Whiskey Buttes Chert	Complete	47.6	29.5	14.3	Absent
753	B	V	Translucent Chert	Complete	44.3	29.4	13.1	Present
799	B	V	Translucent Chert	Terminal	-	20.8	10.1	Present
869	B	VII	Quartzite	Complete	66.9	49.1	21.7	Absent
886	B	VII	Quartzite	Complete	44.7	31.3	13.9	Present
887	B	VII	Opaque Chert	Complete	41.6	32.8	10.1	Present
885	B	VII	Opaque Chert	Terminal	-	26.2	8.1	Present
928	B	V	Quartzite	Complete	55.4	34.9	16.4	Present
932	B	V	Translucent Chert	Complete	38.8	28.9	14.1	Present
943	B	V	Translucent Chert	Complete	49.7	29.2	16.1	Present
946	B	V	Translucent Chert	Complete	35.7	20.5	12.3	Present
949	B	V	Translucent Chert	Complete	29.2	25.7	7.8	Present

Table 14. Continued.

Catalog Number	Excavation Area	Component	Material Type	Condition	Length (mm)	Width (mm)	Thickness (mm)	Cortex
1086	B	IV	Quartzite	Complete	35.4	23.0	16.0	Absent
1082	B	IV	Obsidian	Complete	31.1	19.5	7.2	Present
1150	B	IV	Quartzite	Complete	50.0	38.7	12.3	Absent
1173	B	VII	Opaque Chert	Complete	39.4	34.5	25.7	Present
1198	B	VII	Opaque Chert	Complete	44.6	28.6	10.4	Present
1231	B	V	Translucent Chert	Complete	33.2	21.9	10.1	Present
1248	B	VII	Opaque Chert	Complete	53.3	35.4	19.6	Present
1255	B	V	Quartzite	Complete	58.8	32.7	12.3	Present
1272	B	V	Opaque Chert	Complete	57.6	41.1	11.0	Present
1312	B	V	Translucent Chert	Terminal	-	-	-	Present
1372	B	IV	Translucent Chert	Terminal	-	44.3	14.1	Present
1385	B	IV	Opaque Chert	Terminal	-	39.9	13.4	Present
2037	A S½	VI	Translucent Chert	Complete	37.1	27.3	6.7	Present
2038	A S½	VI	Opaque Chert	Complete	56.5	42.3	11.1	Present
2087	A S½	VI	Translucent Chert	Complete	47.1	28.7	12.1	Present
2096	A S½	VI	Quartzite	Complete	67.1	45.9	16.4	Present
2118	A S½	VI	Quartzite	Complete	79.6	45.6	18.2	Present
2163	A S½	VI	Opaque Chert	Complete	50.1	29.6	15.8	Absent
2199	A S½	VI	Translucent Chert	Complete	50.9	30.4	9.4	Present
2293	A S½	VI	Opaque Chert	Terminal	-	-	-	Absent
2310	A S½	III	Opaque Chert	Terminal	-	48.7	9.2	Present
2360	A S½	VI	Opaque Chert	Terminal	-	33.7	7.0	Present
2369	A S½	VI	Whiskey Buttes Chert	Complete	41.0	31.1	9.1	Absent
2455	A S½	VI	Translucent Chert	Complete	57.2	35.9	22.8	Present
2489	A S½	VI	Opaque Chert	Complete	67.0	36.0	13.6	Present
2503	A S½	VI	Opaque Chert	Complete	36.6	22.0	6.9	Present
2545	A S½	VI	Opaque Chert	Complete	49.9	48.1	19.9	Present
2571	A S½	VI	Opaque Chert	Complete	64.9	56.4	17.1	Present
2578	A S½	VI	Moss Agate	Complete	43.2	26.9	11.4	Present
2642	A S½	VI	Opaque Chert	Complete	43.9	24.7	10.4	Present
2730	A S½	III	Translucent Chert	Complete	29.0	27.1	9.7	Present
2733	A S½	III	Quartzite	Complete	98.5	73.9	21.9	Present
2734	A S½	VI	Translucent Chert	Complete	43.8	25.2	14.3	Present
2737	A S½	VI	Quartzite	Complete	72.9	55.8	29.1	Present
2826	A S½	VI	Translucent Chert	Complete	58.5	35.1	16.6	Present
2836	A S½	III	Translucent Chert	Terminal	-	24.2	8.4	Present
2907	A S½	VI	Opaque Chert	Complete	48.4	26.1	9.1	Absent
2908	A S½	VI	Translucent Chert	Complete	40.0	32.5	13.6	Present
2962	A S½	VI	Translucent Chert	Complete	47.4	29.9	12.3	Present
2963	A S½	VI	Translucent Chert	Complete	57.0	33.3	16.9	Present
3006	A S½	VI	Translucent Chert	Complete	23.2	15.9	5.3	Present

Table 14. Continued.

Catalog Number	Excavation Area	Component	Material Type	Condition	Length (mm)	Width (mm)	Thickness (mm)	Cortex
3024	A S½	III	Translucent Chert	Complete	40.9	25.1	12.0	Present
3025	A S½	III	Opaque Chert	Midsection	-	-	-	Absent
3033	A S½	III	Quartzite	Complete	52.0	28.1	12.6	Absent
3091	A S½	III	Translucent Chert	Complete	41.0	29.7	11.9	Present
3119	A S½	III	Translucent Chert	Complete	38.2	24.8	10.8	Present
3146	A S½	III	Translucent Chert	Complete	45.0	40.3	13.0	Present
3162	A S½	III	Translucent Chert	Terminal	-	32.9	15.7	Present
3172	A S½	III	Opaque Chert	Complete	45.2	38.2	16.0	Present
3173	A S½	III	Quartzite	Complete	60.6	49.3	49.3	Present
3197	A S½	III	Quartzite	Complete	67.3	31.4	17.6	Absent
4082	A N½	I	Opaque Chert	Terminal	-	40.9	9.6	Present
4118	A N½	II	Whiskey Buttes Chert	Terminal	-	29.8	6.5	Present
4129	A N½	I	Translucent Chert	Complete	61.4	39.8	18.4	Present
4153	A N½	II	Opaque Chert	Terminal	-	42.6	9.8	Present
4162	A N½	II	Opaque Chert	Complete	95.1	57.0	26.2	Present
4190	A N½	II	Quartzite	Complete	63.5	40.0	24.6	Absent
4277	A N½	VI	Opaque Chert	Complete	40.9	30.6	10.9	Present
4241	A N½	II	Opaque Chert	Terminal	-	34.5	11.7	Absent
4251	A N½	II	Opaque Chert	Terminal	-	37.0	16.2	Present
4295	A N½	III	Translucent Chert	Complete	43.6	26.2	13.2	Present
4348	A N½	III	Quartzite	Complete	49.9	43.1	19.1	Absent
4366	A N½	VI	Opaque Chert	Complete	50.8	34.5	12.0	Present
4535	A N½	I	Translucent Chert	Complete	57.4	47.1	16.8	Present
4539	A N½	I	Quartzite	Complete	111.6	64.4	31.8	Present
4541	A N½	I	Whiskey Buttes Chert	Complete	64.1	51.7	15.2	Present
4549	A N½	I	Moss Agate	Complete	77.0	50.6	24.4	Present
4597	A N½	I	Translucent Chert	Complete	31.7	24.6	7.8	Present
4701	A N½	I	Opaque Chert	Complete	76.1	48.2	15.2	Present
4702	A N½	I	Translucent Chert	Complete	39.1	33.6	8.7	Present
4704	A N½	I	Quartzite	Complete	77.7	44.5	14.1	Present
4725	A N½	I	Translucent Chert	Complete	39.8	23.4	9.4	Present
4766	A N½	I	Translucent Chert	Complete	39.6	31.4	11.5	Present
4770	A N½	I	Translucent Chert	Terminal	-	45.8	12.0	Present
4776	A N½	I	Quartzite	Complete	77.0	57.1	22.3	Present
4803	A N½	I	Translucent Chert	Complete	63.7	38.3	14.1	Absent
4804	A N½	I	Quartzite	Complete	105.2	75.9	32.4	Present
4805	A N½	I	Quartzite	Complete	88.9	70.6	33.4	Present
4811	A N½	I	Translucent Chert	Complete	56.9	33.6	13.7	Present
4812	A N½	I	Translucent Chert	Complete	63.2	49.3	25.4	Absent
4874	A N½	I	Translucent Chert	Terminal	-	42.9	16.9	Present
4879	A N½	I	Whiskey Buttes Chert	Complete	60.5	48.3	15.7	Present

Table 14. Concluded.

Catalog Number	Excavation Area	Component	Material Type	Condition	Length (mm)	Width (mm)	Thickness (mm)	Cortex
4943	A N½	I	Translucent Chert	Complete	61.9	37.2	15.5	Present
4985	A N½	I	Quartzite	Complete	59.1	44.1	16.6	Present
5055	A N½	I	Quartzite	Complete	51.2	28.6	8.4	Absent
5066	A N½	II	Translucent Chert	Complete	47.8	32.4	13.8	Present
5075	A N½	II	Translucent Chert	Terminal	-	-	-	Absent
5091	A N½	II	Quartzite	Complete	81.0	65.4	22.6	Present
5135	A N½	II	Quartzite	Complete	78.0	49.3	15.6	Absent
5148	A N½	I	Translucent Chert	Complete	52.8	34.9	10.1	Present
5152	A N½	I	Translucent Chert	Complete	56.7	42.5	10.1	Present
5159	A N½	I	Whiskey Buttes Chert	Complete	63.7	47.6	15.0	Absent
5161	A N½	I	Translucent Chert	Terminal	-	44.1	17.3	Present
5181	A N½	I	Opaque Chert	Complete	52.1	33.9	15.3	Present
5198	A N½	I	Translucent Chert	Complete	64.7	27.1	10.2	Absent

Note: All catalog numbers have the prefix SCL14.

Kruskal-Wallis one-way analysis of variance was used to statistically measure whether the means of the length, width, and thickness are significantly different between the components. The null hypothesis was that the measurement means are the same for each of the components to be rejected at the .05 alpha level. The computed H value for the length measurements was 29.76 significant at the .0001 level; for the width, it was 33.34 significant at the .0001 level; and for the thickness, it was 4.93 significant at the .552 level. Given these H values, the null hypothesis can be rejected for the length and width measurements but not for the thickness. The means listed on Table 16 clearly show that the preblanks from the earlier components are larger than those in the later ones.

Comparisons of preblanks between components indicate that the same material types were selected throughout the prehistory of the Taliaferro site, though larger cobbles were used in the earlier Archaic periods. Given that over 50% of the preblanks for most components are of translucent algalitic chert, this material was probably the most desired; however, at present, cherts are most prevelent in small cobbles and pebbles around the Taliaferro site. The people of the earlier occupations at the site, who were producing the large bifaces, had to rely in part on the larger quartzite cobbles, the second most common material type in these components.

Table 15. Crosstabulation of preblanks by component and material type, Taliaferro site.

Component		Material Type						
		Translucent Chert	Opaque Chert	Quartzite	Moss Agate	Whiskey Buttes Chert	Obsidian	Total
I	#	16	3	7	1	3	0	30
	Row %	53.3	10.0	23.3	3.3	10.0	0	22.9
	Column %	25.4	9.1	26.9	50.0	50.0	0	
	Total %	12.2	2.3	5.3	0.8	2.3	0	
II	#	2	4	3	0	1	0	10
	Row %	20.0	40.0	30.3	0	10.0	0	7.6
	Column %	3.2	12.1	11.5	0	16.7	0	
	Total %	1.5	3.1	2.3	0	0.8	0	
III	#	8	3	5	0	0	0	16
	Row %	50.0	18.8	31.3	0	0	0	12.2
	Column %	12.7	9.1	19.2	0	0	0	
	Total %	6.1	2.3	3.8	0	0	0	
IV	#	1	1	2	0	0	1	5
	Row %	20.0	20.0	40.0	0	0	20.0	3.8
	Column %	1.6	3.0	7.7	0	0	100.0	
	Total %	0.8	0.8	1.5	0	0	0.8	
V	#	10	2	2	0	1	0	15
	Row %	66.7	13.3	13.3	0	6.7	0	11.5
	Column %	15.9	6.1	7.7	0	16.7	0	
	Total %	7.6	1.5	1.5	0	0.8	0	
VI	#	10	12	3	1	1	0	27
	Row %	37.0	44.4	11.1	3.7	3.7	0	20.6
	Column %	15.9	36.4	11.5	50.0	16.7	0	
	Total %	7.6	9.2	2.3	0.8	0.8	0	
VII	#	16	8	4	0	0	0	28
	Row %	57.1	28.6	14.3	0	0	0	21.4
	Column %	25.4	24.2	15.4	0	0	0	
	Total %	12.2	6.1	3.1	0	0	0	
Total	#	63	33	26	2	6	1	131
	%	48.1	25.2	19.8	1.5	4.6	.8	100.0

Blanks

Artifacts belonging to this category follow the preblank stage within the reduction continuum of bifacial stone tool manufacture. They are fairly thick and blocky in cross section and usually exhibit flaking around the entire margins. Blanks are generally irregular in outline. These bifaces often retain some cortex at least on one side, especially those made from thin raw materials. They still retain platforms necessary for further thinning and are usually suitable for reducing into several final tool forms. Blanks could be used as the intended tool without additional reduction, but most in this collection appear to have been discarded because of defects in the material or breakage. Most of these were manufactured by the bifacial reduction of cobbles or pebbles, except in a few cases when a large flake was reduced.

Table 16. The mean, standard deviation, and variance of the length, width, and thickness of preblanks by component, Taliaferro site.

	Component							
	I	II	III	IV	V	VI	VII	Total
				Length (mm)				
Number	26	5	12	3	13	25	23	107
Mean	63.5	73.0	50.9	38.8	47.3	51.0	42.9	52.5
Standard Deviation	18.6	18.0	18.0	9.9	10.3	12.6	9.4	16.6
Variance	348.8	325.6	326.4	98.1	106.1	160.9	89.3	276.3
				Width (mm)				
Number	30	9	15	5	14	26	28	127
Mean	43.4	43.1	36.2	33.0	29.0	33.9	28.9	35.4
Standard Deviation	1.24	11.9	13.4	11.0	5.7	9.8	7.0	11.6
Variance	154.7	142.6	181.3	122.5	33.0	96.9	50.1	136.0
				Thickness (mm)				
Number	30	9	15	5	14	26	28	127
Mean	16.2	16.3	14.3	12.6	12.7	13.3	13.1	14.2
Standard Deviation	7.0	6.8	4.5	3.3	2.4	5.3	4.9	5.5
Variance	49.8	46.5	21.0	10.9	5.9	29.1	24.7	30.8

A total of 114 blanks was recovered from the Taliaferro site (Figure 11, q-i): 36 were recovered from the south half of Excavation Area A, 38 were from the north half of Area A, and the remaining 40 were found in Area B. Forty of 114 blanks were complete. Table 17 lists the characteristics of the individual specimens. Fragments were indicated as terminal or midsection under the heading Condition on the table. The width of the fragments was taken at the widest point on the remaining portion, and in most instances it may represent the broadest area of the complete artifact before breakage. No measurements are given for small fragments. The general shape of the complete specimens also is provided, though they could be further thinned into preforms or end products with several different outlines.

One blank (SCL14.5158) in the Early Archaic Component I is unique for this artifact class. It exhibits fine, unifacial retouch around most of the margin, though the artifact has only been reduced to the blank stage. This implement was made from a large flake of opaque algalitic chert, which was slightly bifacially reduced before the retouch was added. The function of the tools is not known.

Translucent and opaque algalitic cherts are the dominant material types of the blanks with 43 (37.7%) and 37 (32.5%) respectively (Table 18). The next most common material is quartzite with 27 (23.7%), and the others include moss agate and Whiskey Buttes chert. The crosstabulation of the blanks by material type and component is shown in Table 18. Twenty-five blanks were associated with the Early Archaic Component I, and 60.0% are quartzite. The remaining specimens are distributed among translucent and opaque algalitic cherts, Whiskey Buttes chert, and moss agate. Half of the eight specimens recovered from Component II are of translucent algalitic chert, and the other four are represented by the other materials except for moss agate. Component

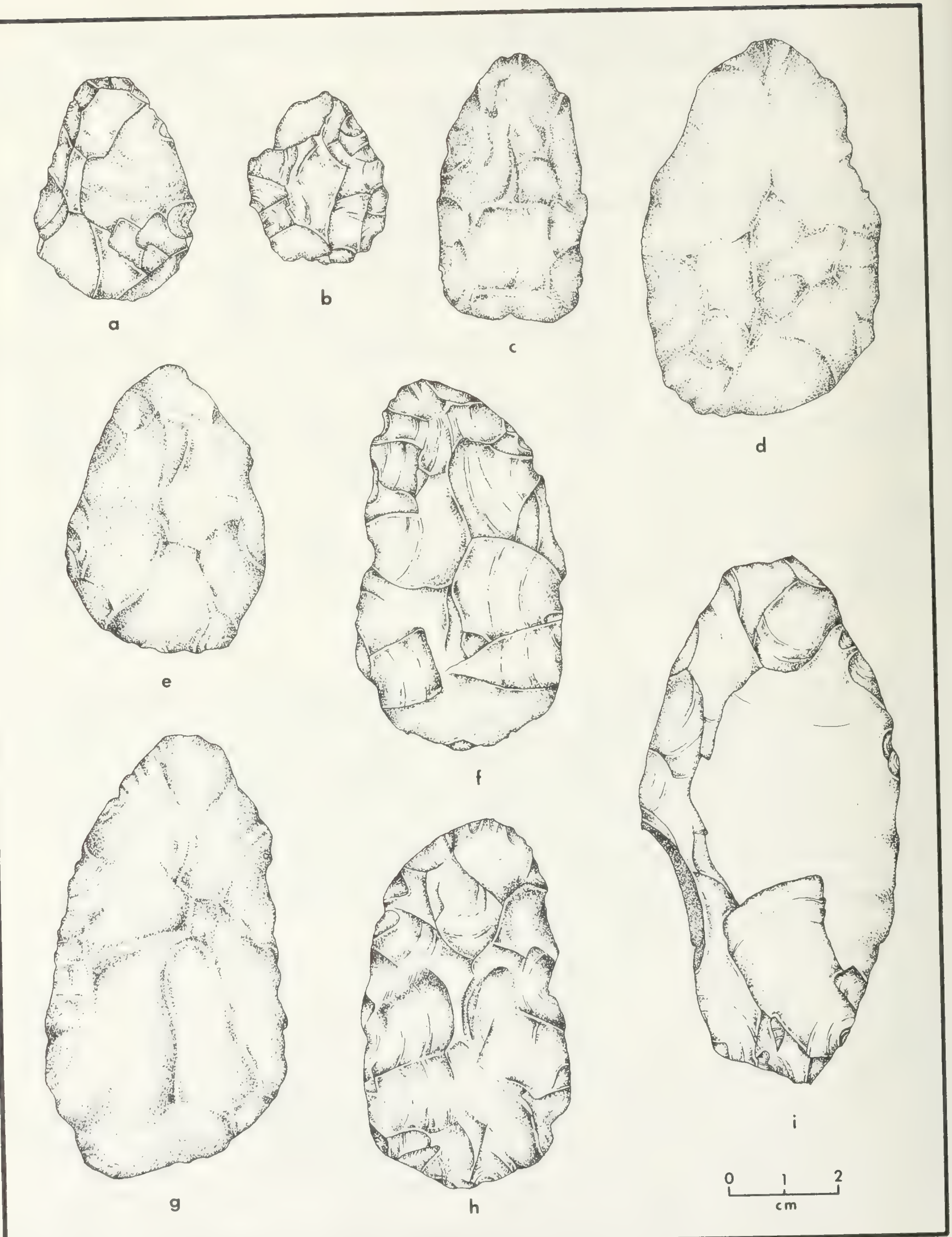


Figure 11. Selected blanks from the Taliaferro site. Provenience: Component I, b. SCL14.4807, f. SCL14.4623, g. SCL14.4648, i. SCL14.5158; Component II, e. SCL14.4178; Component IV, h. SCL14.1050; Component V, c. SCL14.806; Component VI, a. SCL14.2204; Component VII, d. SCL14.480.

Table 17. Characteristics of blanks by catalog number, Taliaferro site.

Catalog Number	Excavation Area	Component	Material Type	Condition	Length (mm)	Width (mm)	Thickness (mm)	Shape	Cortex
329	B	VII	Opaque Chert	Terminal	-	-	-	Unknown	Absent
333	B	VII	Whiskey Buttes Chert	Terminal	-	-	-	Unknown	Absent
340	B	VII	Opaque Chert	Terminal	-	20.4	4.9	Unknown	Absent
351	B	VII	Quartzite	Terminal	-	38.1	8.9	Unknown	Absent
366	B	VII	Translucent Chert	Terminal	-	42.3	8.5	Unknown	Present
383	B	VII	Opaque Chert	Terminal	-	27.2	8.4	Unknown	Present
384	B	VII	Quartzite	Midsection	-	67.8	17.8	Unknown	Absent
401	B	V	Opaque Chert	Terminal	-	-	-	Unknown	Absent
405	B	VII	Quartzite	Terminal	-	34.7	14.2	Unknown	Absent
466	B	VII	Opaque Chert	Terminal	-	25.6	6.4	Unknown	Absent
467	B	VII	Opaque Chert	Complete	51.1	25.5	8.7	Bipointed	Absent
468	B	VII	Translucent Chert	Terminal	-	21.8	7.6	Unknown	Absent
480	B	VII	Translucent Chert	Terminal	-	23.7	7.4	Unknown	Absent
482	B	VII	Translucent Chert	Terminal	-	-	-	Unknown	Absent
521	B	V	Translucent Chert	Terminal	-	-	-	Unknown	Present
552	B	VII	Translucent Chert	Terminal	-	22.3	4.6	Unknown	Present
561	B	VII	Translucent Chert	Complete	32.4	16.5	6.2	Lanceolate	Absent
617	B	IV	Translucent Chert	Complete	37.1	27.9	9.9	Acuminate	Present
704	B	V	Translucent Chert	Complete	31.0	18.1	8.0	Lanceolate	Absent
740	B	V	Translucent Chert	Terminal	-	27.0	8.1	Unknown	Present
806	B	V	Quartzite	Complete	47.2	25.8	11.1	Lanceolate	Absent
817	B	IV	Opaque Chert	Terminal	-	-	-	Unknown	Present
1050	B	IV	Opaque Chert	Complete	65.6	35.9	9.2	Ovate	Absent
1076	B	V	Opaque Chert	Terminal	-	32.1	8.7	Unknown	Present
1179	B	VII	Translucent Chert	Complete	32.5	18.8	6.8	Triangular	Absent
1199	B	VII	Opaque Chert	Midsection	-	-	-	Unknown	Absent

Table 17. Continued.

Catalog Number	Excavation Area	Component	Material Type	Condition	Length (mm)	Width (mm)	Thickness (mm)	Shape	Cortex
1204	B	VII	Translucent Chert	Terminal	-	25.5	8.7	Unknown	Present
1226	B	V	Translucent Chert	Complete	30.8	13.1	8.0	Lanceolate	Absent
1227	B	IV	Opaque Chert	Terminal	-	26.6	7.3	Unknown	Present
1230	B	V	Opaque Chert	Terminal	-	27.0	6.1	Unknown	Present
1235	B	IV	Translucent Chert	Terminal	-	20.6	9.6	Unknown	Present
1236	B	IV	Translucent Chert	Terminal	-	30.9	10.4	Unknown	Present
1237, 1244	B	IV	Whiskey Buttes Chert	Terminal	-	37.6	9.2	Unknown	Present
1240	B	IV	Translucent Chert	Terminal	-	-	-	Unknown	Absent
1251	B	VII	Translucent Chert	Terminal	-	26.8	7.1	Unknown	Absent
1262	B	IV	Opaque Chert	Complete	59.2	22.6	10.8	Lanceolate	Absent
1327	B	VII	Translucent Chert	Terminal	-	32.8	7.8	Unknown	Absent
1341	B	V	Quartzite	Terminal	-	29.1	9.1	Unknown	Absent
1358	B	IV	Translucent Chert	Terminal	-	-	-	Unknown	Present
1415	B	IV	Opaque Chert	Terminal	-	32.3	6.9	Unknown	Present
2040	A S½	VI	Whiskey Buttes Chert	Terminal	-	-	-	Unknown	Absent
2093	A S½	VI	Translucent Chert	Complete	37.4	20.7	6.2	Lanceolate	Absent
2204	A S½	VI	Translucent Chert	Complete	38.9	27.9	9.1	Acuminate	Present
2206	A S½	VI	Quartzite	Terminal	-	-	-	Unknown	Absent
2253	A S½	III	Translucent Chert	Terminal	-	26.7	7.6	Unknown	Absent
2267	A S½	VI	Translucent Chert	Midsection	-	-	-	Unknown	Present
2292	A S½	VI	Translucent Chert	Complete	37.7	25.5	9.7	Acuminate	Absent
2332	A S½	III	Opaque Chert	Terminal	-	24.6	9.2	Unknown	Absent
2336	A S½	VI	Translucent Chert	Complete	-	40.2	7.8	Acuminate	Absent

Table 17. Continued.

Catalog Number	Excavation Area	Component	Material Type	Condition	Length (mm)	Width (mm)	Thickness (mm)	Shape	Cortex
2382	A S½	VI	Translucent Chert	Complete	-	27.5	6.7	Unknown	Absent
2392	A S½	VI	Opaque Chert	Terminal	-	-	-	Unknown	Absent
2410	A S½	VI	Translucent Chert	Terminal	-	-	-	Unknown	Absent
2428	A S½	III	Translucent Chert	Terminal	-	30.4	10.1	Unknown	Absent
2438	A S½	VI	Translucent Chert	Terminal	-	-	-	Unknown	Absent
2469	A S½	VI	Translucent Chert	Terminal	-	-	-	Unknown	Absent
2484	A S½	III	Opaque Chert	Complete	61.0	41.1	9.8	Triangular	Absent
2785	A S½	III	Opaque Chert	Midsection	-	27.8	6.9	Unknown	Absent
2787	A S½	III	Opaque Chert	Terminal	-	41.9	7.5	Unknown	Present
2956	A S½	VI	Quartzite	Complete	64.4	37.6	12.9	Acuminate	Absent
2995	A S½	VI	Opaque Chert	Terminal	-	29.8	7.8	Unknown	Absent
2996	A S½	VI	Opaque Chert	Complete	67.8	41.7	9.8	Triangular	Absent
3001	A S½	VI	Opaque Chert	Terminal	-	24.3	4.6	Unknown	Present
3008	A S½	VI	Translucent Chert	Terminal	-	-	-	Unknown	Absent
3013	A S½	VI	Translucent Chert	Terminal	-	30.6	6.7	Unknown	Absent
3019	A S½	III	Translucent Chert	Terminal	-	28.1	7.8	Unknown	Absent
3023	A S½	III	Opaque Chert	Terminal	-	-	-	Unknown	Absent
3047	A S½	VI	Opaque Chert	Terminal	-	31.1	6.6	Unknown	Present
3061	A S½	VI	Whiskey Buttes Chert	Terminal	-	-	-	Unknown	Absent
3074	A S½	III	Opaque Chert	Complete	31.5	24.7	8.7	Ovate	Absent
3100	A S½	VI	Opaque Chert	Terminal	-	28.7	10.3	Unknown	Present
3104	A S½	VI	Translucent Chert	Terminal	-	24.6	6.1	Unknown	Present
3111	A S½	III	Translucent Chert	Terminal	-	41.4	9.0	Unknown	Absent
3130	A S½	III	Opaque Chert	Complete	57.1	27.9	5.9	Irregular	Absent
3193	A S½	III	Opaque Chert	Terminal	-	40.4	7.2	Unknown	Absent
3208	A S½	III	Translucent Chert	Terminal	-	33.7	6.1	Unknown	Present
3216	A S½	III	Quartzite	Terminal	-	40.9	13.2	Unknown	Absent

Table 17. Continued.

Catalog Number	Excavation Area	Component	Material Type	Condition	Length (mm)	Width (mm)	Thickness (mm)	Shape	Cortex
4066	A N½	III	Translucent Chert	Complete	40.9	22.1	10.5	Laneolate	Present
4083	A N½	I	Quartzite	Complete	35.9	32.7	6.9	Round	Absent
4136	A N½	II	Translucent Chert	Terminal	-	34.6	9.1	Unknown	Absent
4145	A N½	III	Opaque Chert	Terminal	-	41.6	10.4	Unknown	Present
4146	A N½	III	Opaque Chert	Terminal	-	-	-	Unknown	Absent
4157	A N½	II	Whiskey Buttes Chert	Terminal	-	32.0	9.2	Unknown	Absent
4161	A N½	II	Opaque Chert	Terminal	-	35.4	8.9	Unknown	Absent
4178	A N½	II	Quartzite	Complete	51.7	35.1	13.7	Acuminate	Absent
4336	A N½	II	Translucent Chert	Complete	43.7	25.1	12.8	Ovate	Absent
4415	A N½	III	Quartzite	Complete	55.4	31.6	16.6	Ovate	Absent
4427	A N½	I	Quartzite	Complete	73.6	45.2	21.5	Ovate	Absent
4504	A N½	III	Opaque Chert	Midsection	-	-		Unknown	Absent
4522	A N½	III	Quartzite	Complete	68.7	25.4	11.2	Ovate	Present
4551	A N½	I	Quartzite	Complete	42.3	26.6	14.6	Ovate	Absent
4555	A N½	I	Quartzite	Terminal	-	32.5	13.1	Unknown	Absent
4610	A N½	I	Translucent Chert	Terminal	-	29.4	7.8	Unknown	Absent
4623	A N½	III	Quartzite	Complete	76.1	49.0	15.6	Acuminate	Absent
4648	A N½	III	Quartzite	Complete	79.2	42.3	19.3	Acuminate	Absent
4657	A N½	II	Opaque Chert	Complete	70.3	38.7	19.9	Ovate	Absent
4724	A N½	I	Translucent Chert	Terminal	-	27.4	7.7	Unknown	Present
4765	A N½	I	Opaque Chert	Complete	62.6	38.2	13.7	Acuminate	Absent
4807	A N½	I	Quartzite	Complete	65.9	43.4	17.9	Acuminate	Present
4809	A N½	I	Quartzite	Complete	56.5	29.4	8.5	Ovate	Absent
4821	A N½	I	Quartzite	Complete	50.5	30.1	11.7	Acuminate	Absent
4928	A N½	II	Translucent Chert	Complete	49.3	47.6	14.8	Round	Absent
4963	A N½	II	Translucent Chert	Complete	57.9	45.5	14.3	Ovate	Absent
4973	A N½	I	Opaque Chert	Complete	70.6	39.1	13.5	Ovate	Absent
5020	A N½	I	Opaque Chert	Terminal	-	-	-	Unknown	Absent
5052	A N½	I	Whiskey Buttes Chert	Terminal	-	35.6	12.6	Unknown	Absent

Table 17. Concluded.

Catalog Number	Excavation Area	Component	Material Type	Condition	Length (mm)	Width (mm)	Thickness (mm)	Shape	Cortex
5054	A N½	I	Moss Agate	Complete	48.1	28.6	8.4	Ovate	Absent
5144	A N½	I	Quartzite	Complete	51.2	36.9	10.7	Ovate	Absent
5147	A N½	I	Quartzite	Terminal	-	-	-	Unknown	Absent
5158	A N½	I	Opaque Chert	Complete	92.7	46.6	18.1	Ovate	Absent
5177	A N½	I	Quartzite	Terminal	-	-	-	Unknown	Absent
5182	A N½	I	Quartzite	Complete	70.7	34.9	12.7	Triangular	Absent
5208	A N½	I	Translucent Chert	Terminal	-	-	-	Unknown	Absent
5143	A N½	I	Quartzite	Terminal	-	54.6	12.5	Unknown	Absent

Note: All catalog numbers have the prefix SCL14.

Table 18. Crosstabulation of blanks by component and material type, Taliaferro site.

Component		Translucent Chert	Opaque Chert	Quartzite	Moss Agate	Whiskey Buttes Chert	Total
		Material Type					
I	#	3	5	15	1	1	25
	Row %	12.0	20.0	60.0	4.0	4.0	21.9
	Column %	7.0	13.5	55.6	100.0	16.7	
	Total %	2.6	4.4	13.2	.9	.9	
II	#	4	2	1	0	1	8
	Row %	50.0	25.0	12.5	0	12.5	7.0
	Column %	9.3	5.4	3.7	0	16.7	
	Total %	3.5	1.8	.9	0	.9	
III	#	6	10	3	0	0	19
	Row %	31.6	52.6	15.8	0	0	16.7
	Column %	14.0	27.0	11.1	0	0	
	Total %	5.3	8.8	2.6	0	0	
IV	#	5	5	0	0	1	11
	Row %	45.5	45.5	0	0	9.1	9.6
	Column %	11.6	13.5	0	0	16.7	
	Total %	4.4	4.4	0	0	.9	
V	#	4	3	2	0	0	9
	Row %	44.4	33.3	22.2	0	0	7.9
	Column %	9.3	8.1	7.4	0	0	
	Total %	3.5	2.6	1.8	0	0	
VI	#	11	6	3	0	2	22
	Row %	50.0	27.3	13.6	0	9.1	19.3
	Column %	25.6	16.2	11.1	0	33.3	
	Total %	9.6	5.3	2.6	0	1.8	
VII	#	10	6	3	0	1	20
	Row %	50.0	30.0	15.0	0	5.0	17.5
	Column %	23.3	16.2	11.1	0	16.7	
	Total %	8.8	5.3	2.6	0	.9	
Total	#	43	37	27	1	6	114
	%	37.7	32.5	23.7	.9	5.3	100.0

III, with 19 specimens, is dominated by opaque algalitic chert (52.6%), 31.6% are of translucent algalitic chert, and the remaining 15.8% are of quartzite. As shown in Table 18, each of the three Archaic Components is quite different in the amount and percentages of the material types represented.

The Late Prehistoric Components IV-VII contain 61 blanks, and almost half from each component are of translucent algalitic chert (Table 18). The next most common material for the Late Prehistoric is opaque algalitic chert. Other material types in small amounts include quartzite and Whiskey Buttes chert. All Late Prehistoric components lacked specimens of moss agate. In the kinds and percentages of materials of blanks, the four Late Prehistoric components are similar.

As with the preblanks, the chi-square test of statistical significance was used to examine if differences exist in the raw material types in the three Archaic components and the Late Prehistoric period. For this test, the data for the four Late Prehistoric components were combined. The null hypothesis of no difference was used with the alpha level of .05 for rejection. The chi-square value was 33.96 with 12 degrees of freedom and was significant at the .0007 level. Cramer's V was computed at .3151. The above chi-square value indicates that significant differences occur in the material types of blanks between cultural components.

Given the significant results of the chi-sqaure test, quartzite was the favored material during Component I times, and opaque algalitic chert was most important in Component III (Table 18). Translucent algalitic chert dominants in the Middle Archaic Component II. During the Late Prehistoric, the dominant material type also was translucent algalitic chert with opaque algalitic chert as the second most common type.

The mean, standard deviation, and variance of the length, width, and thickness of the blanks by component are shown in Table 19. The Kruskal-Wallis one-way analysis of variance was used to statistically measure whether differences in the measurements of these artifacts exist between components. This nonparametric test was conducted under the null hypothesis of no difference between components using the .05 alpha level for rejection. The computed H value for the length measurements was 12.691 significant at the .048 level; for the width, it was 21.615 significant at the .001 level; and for the thickness, it was 27.040 significant at the .0001 level. The results show significant differences occur in the size of the blanks between components. As is evident by the means listed on Table 19, artifacts from the Archaic components are generally larger than those of the Late Prehistoric.

The chi-square and Kruskal-Wallis statistical tests conducted on the material types and size of the blanks by component indicate significant differences in these artifacts through time. The largest blanks in the collection were produced from quartzite during Component I times while the smallest ones were manufactured from translucent algalitic chert during the Late Prehistoric. Blanks from Components II and III, though made of various cherts, also appear to be larger than those from the Late Prehistoric, but they are smaller than those from Component I. In the vicinity of the Taliaferro site at present, quartzite cobbles are much larger than those of chert, which probably explains the dominance of quartzite for the larger blanks in Component I.

In the preblank collection, differences in size but not material type was significant between the components. Many of the preblanks made from materials other than quartzite in Component I were probably rejected due to flaws encountered during this early stage and only quartzite, present in larger and more flakable cobbles, made it to the blank stage. Quartzite was the second most common material type of preblanks in the Early Archaic Component I.

Preforms

Bifacially flaked stone artifacts that have regular outlines, generally thin cross sections, and little or no cortex were classified as preforms. Many also exhibit some edge retouch which serves to normalize the edge. Artifacts grouped into this category belong to the stage just preceding the final end product and follow the blanks within the reduction continuum of bifacial flake stone tool manufacture. Preforms are usually reduced to the point where only notching or retouch is required for the development of the

Table 19. The mean, standard deviation, and variance of the length, width, and thickness of blanks by component, Taliaferro site.

	Component							
	I	II	III	IV	V	VI	VII	Total
				Length (mm)				
Number	14	5	6	3	3	6	3	40
Mean	62.5	54.5	52.4	53.9	36.3	47.7	38.6	53.4
Standard Deviation	15.8	10.1	13.7	14.9	9.4	14.3	10.7	15.5
Variance	251.8	103.1	188.5	223.6	88.5	204.5	115.9	241.4
				Width (mm)				
Number	20	8	17	8	7	12	16	88
Mean	37.6	36.7	32.3	30.5	24.6	29.1	29.3	32.1
Standard Deviation	8.3	7.2	7.2	4.8	6.6	5.7	12.4	9.0
Variance	70.1	52.2	52.6	23.9	43.9	33.5	154.2	81.3
				Thickness (mm)				
Number	20	8	17	8	7	13	16	89
Mean	12.9	12.8	9.2	9.1	8.4	8.0	8.3	10.1
Standard Deviation	4.0	3.7	2.6	1.3	1.5	2.2	3.3	3.6
Variance	16.4	14.1	7.2	1.9	2.2	5.0	10.9	13.0

final product. Most of the preforms were produced by the bifacial reduction of cobbles or pebbles, except in a few cases when a large flake was reduced. Though some could be considered as final bifaces, they are placed in this category because most appear to have been broken and discarded before completion.

A total of 338 preforms was recovered from the excavations at the Taliaferro Site; only 42 were complete, and of these, 16 were found in two pieces and refitted. Using general overall size, they were sorted into two groups: large and small preforms. Forty-two specimens, 4 entire and 38 broken ones, were classified as large preforms. The 38 complete small preforms were further divided into five types (I, IIa, IIb, III, and IV) based on maxmium length compared to width and overall shape. The remaining 258 were either proximal, distal, or midsection pieces and are mostly portions of small preforms that lack the overall length for classification into one of the small preform types.

Table 20 shows the mean, standard deviation, and variance of the length, width, and thickness of each preform type. As is evident by the means listed on the table, the large preforms are at least twice as large as the small preform types. The Kruskal-Wallis one-way analysis of variance test was used to statistically measure whether differences in the size of preforms exist between the types. The null hypothesis was that the measurements are equal between the types to be rejected at the .05 alpha level. The computed H value for the length measurements was 32.639 significant at the .0001 level; for the width measurements, it was 61.544 significant at the .0001 level; and for the thickness, it was 53.321 significant at the .0001 level. The various preform types differ significantly in size.

Table 20. The mean, standard deviation, and variance of the length, width, and thickness of the preforms by type, Taliaferro site.

	Large Preform	Small Preform Type: Type I	Type IIa	Type IIb	Type III	Type IV	Total
Length (mm)							
Number	4	9	12	11	5	1	42
Mean	70.6	45.5	34.3	29.2	34.9	18.7	38.5
Standard Deviation	8.2	2.8	3.0	4.7	2.2	0	12.8
Variance	67.9	7.9	9.1	23.0	5.1	0	165.5
Width (mm)							
Number	37	9	12	11	5	1	75
Mean	37.4	16.1	15.0	18.9	24.9	13.4	27.4
Standard Deviation	7.4	1.2	1.8	1.8	1.2	0	11.5
Variance	55.3	1.6	3.3	3.5	1.6	0	132.9
Thickness (mm)							
Number	42	9	12	11	5	1	80
Mean	7.4	3.7	3.5	3.9	6.4	2.2	5.8
Standard Deviation	2.0	1.1	0.9	1.2	1.1	0	2.4
Variance	4.2	1.4	0.9	1.5	1.2	0	6.1

Large Preforms

Forty-two specimens were classified as large preforms (Figure 12 a-e; Figure 13 a-f); only four are complete. Fragments were included in this category because they were much larger than any of the small preform types. Due to the fragmentary nature of the collection, all preforms were considered as one group. Table 21 details the characteristics of these bifaces by catalog number. Fragments were indicated as terminal or midsection in the table because it was often difficult to distinguish distal from proximal portions. Obvious proximal pieces were described on the table by the shape of the base. The maximum width of the fragments was taken at the broadest point on the original complete artifact.

Most of the distinquishable proximal portions have straight margins and a distinctive square to slightly rounded base. A large preform from Component VI (SCL14.2348) has a stemmed base (Chapter 4, Figure 62b). The width of these base fragments ranges from 26.0 to 56.9 mm, and the length of the complete specimens range from 59.4 to 77.0 mm. Table 20 provides the mean and standard deviation of the length, width, and thickness of the preforms. Thirty-three are of quartzite of various colors, and the other nine are of opaque algalitic chert (Table 22). This heavy reliance on quartzite for this preform type is probably due to the large size of the quartzite cobbles in the site vicinity; most chert cobbles are too small to create these large artifacts.

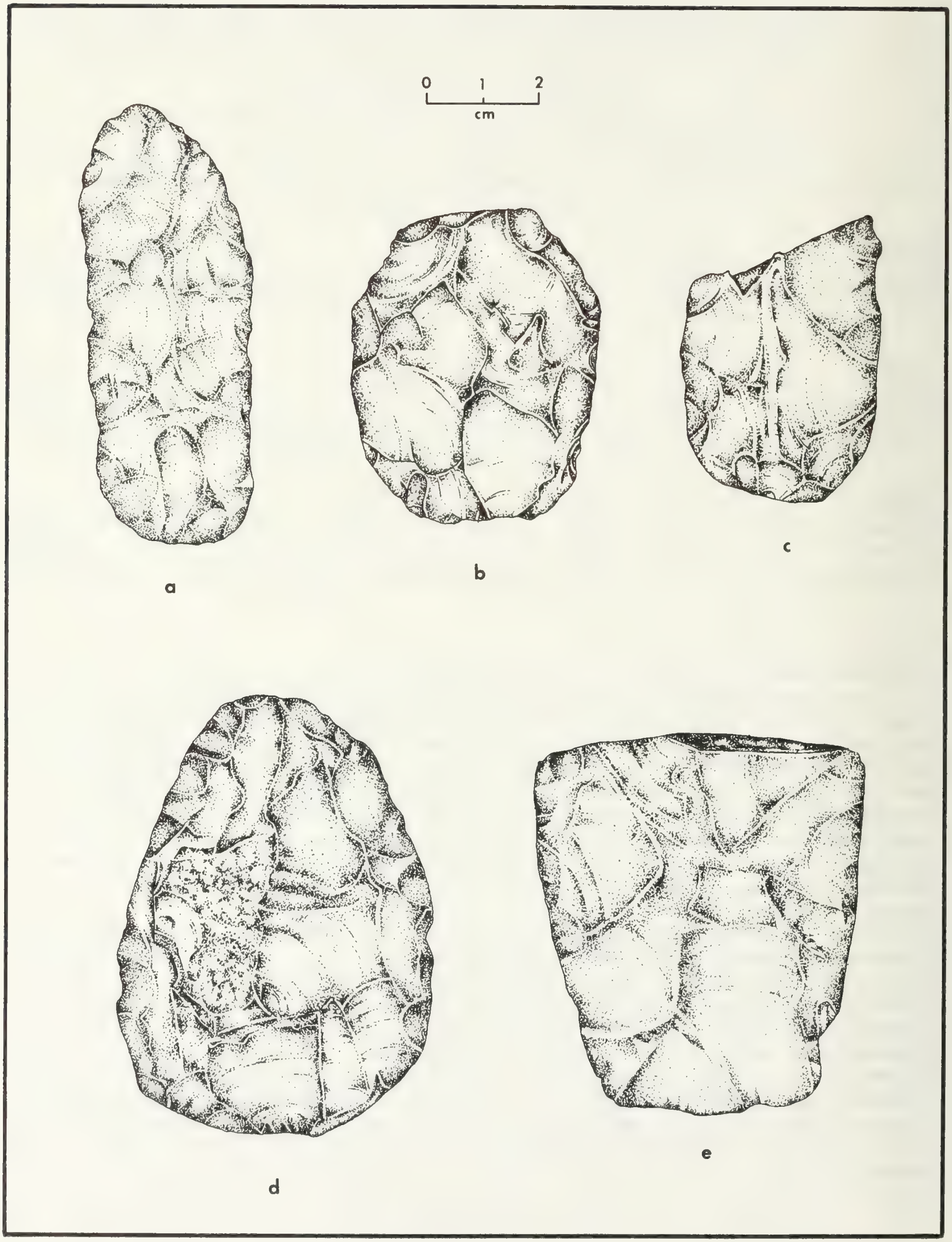


Figure 12. Selected large preforms from the Taliaferro site. Provenience: Component I, b. SCL14.5146; c. SCL14.5150; d. SCL14.4649; e. SCL14.4912; Component VI, a. SCL14.2857.

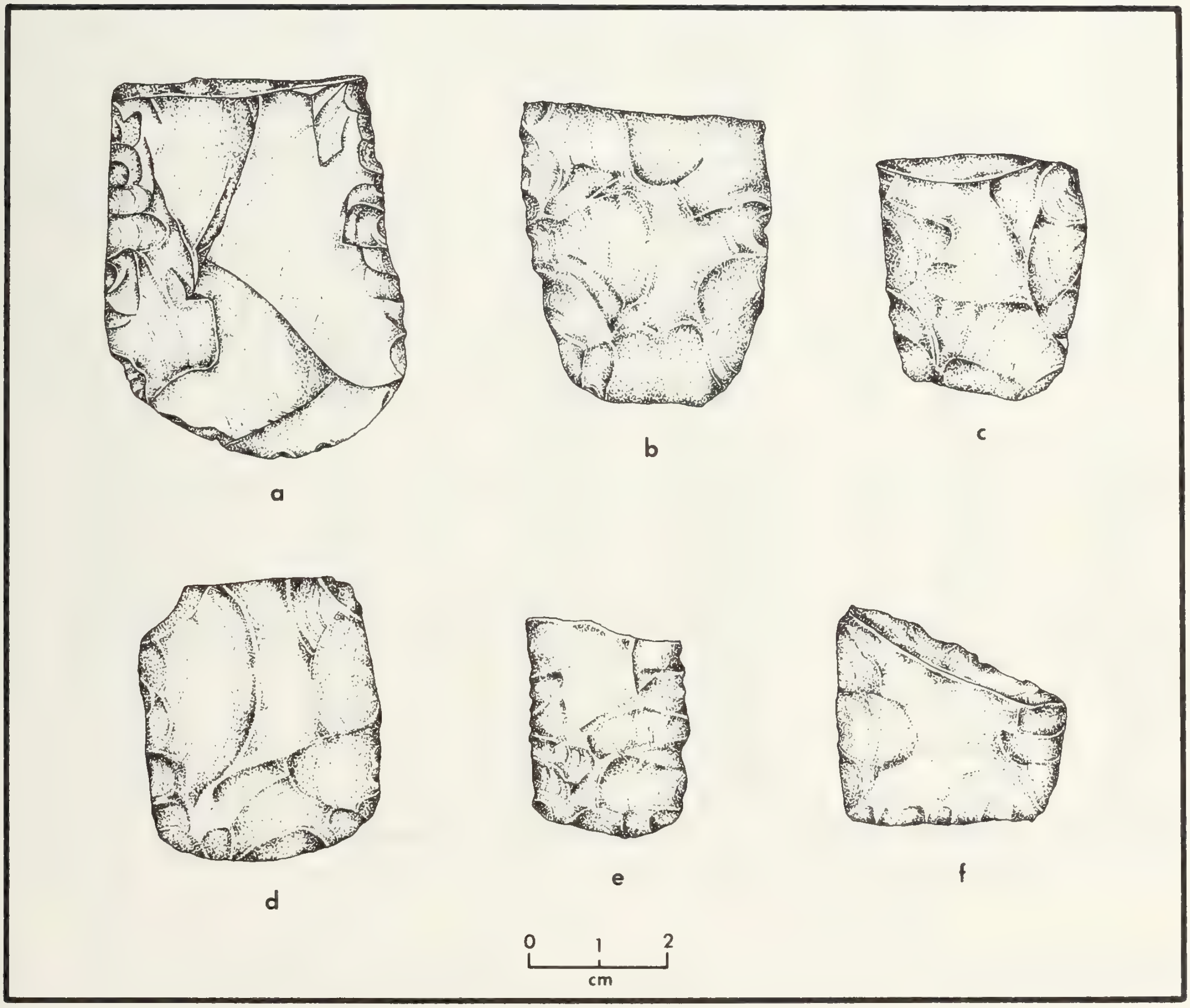


Figure 13. Selected large preforms from the Taliaferro site. Provenience: Component I, a. SCL14.4768; b. SCL14.5110; c. SCL14.5162; Component II, d. SCL14.4212; Component III, e. SCL14.4264; Component IV, f. SCL142496.

Table 21. Characteristics of the large preforms by catalog number, Taliaferro site.

Catalog Number	Excavation Area	Component	Material Type	Condition	Length (mm)	Width (mm)	Thickness (mm)	Shape
256	B	VII	Quartzite	Terminal	-	41.4	5.5	Unknown
300	B	V	Quartzite	Terminal	-	41.2	6.9	Unknown
415	B	V	Quartzite	Terminal	-	35.4	4.6	Unknown
443	B	V	Opaque Chert	Midsection	-	49.2	5.1	Unknown
593	B	VII	Opaque Chert	Terminal	-	34.9	5.4	Square Base
653	B	V	Opaque Chert	Terminal	-	43.5	5.4	Unknown
766	B	IV	Quartzite	Terminal	-	36.9	6.4	Square Base
798	B	V	Quartzite	Terminal	-	49.5	8.6	Unknown
907	B	VII	Quartzite	Terminal	-	-	6.9	Unknown
910	B	VII	Quartzite	Terminal	-	42.1	7.9	Unknown
2097	A S½	VI	Quartzite	Terminal	-	38.9	8.1	Square Base
2248	A S½	III	Quartzite	Terminal	-	40.4	9.3	Unknown
2348	A S½	VI	Opaque Chert	Terminal	-	34.9	4.6	Stemmed Base
2496	A S½	VI	Quartzite	Terminal	-	32.5	6.1	Square Base
2857	A S½	VI	Quartzite	Terminal	77.0	26.0	7.5	Square Base
2866	A S½	VI	Quartzite	Terminal	-	37.7	9.3	Unknown
3106	A S½	VI	Quartzite	Terminal	-	-	5.7	Unknown
3132	A S½	III	Opaque Chert	Terminal	-	36.8	7.6	Unknown
3174	A S½	III	Quartzite	Terminal	-	34.6	8.2	Unknown
4010	A N½	II	Quartzite	Terminal	-	38.8	6.4	Unknown
4205	A N½	II	Quartzite	Terminal	-	29.1	5.9	Unknown
4206	A N½	II	Opaque Chert	Terminal	-	35.9	6.8	Square Base
4212	A N½	II	Quartzite	Terminal	-	32.8	8.9	Square Base
4264	A N½	III	Quartzite	Terminal	-	21.4	5.5	Square Base
4305	A N½	II	Quartzite	Terminal	-	-	7.4	Unknown
4417	A N½	III	Quartzite	Terminal	-	33.7	5.1	Square Base
4447	A N½	II	Quartzite	Terminal	-	29.1	6.9	Unknown
4582	A N½	I	Quartzite	Terminal	-	32.7	7.3	Round Base
4622	A N½	I	Quartzite	Terminal	-	41.7	7.9	Unknown
4649	A N½	I	Quartzite	Complete	76.0	54.9	15.7	Round Base
4768	A N½	I	Opaque Chert	Terminal	-	41.6	6.6	Round Base
4779	A N½	I	Quartzite	Terminal	-	38.0	7.4	Unknown
4808, 4642	A N½	I	Quartzite	Complete	59.4	30.0	8.6	Round Base
4912	A N½	I	Quartzite	Terminal	-	56.9	12.6	Square Base
4962	A N½	II	Quartzite	Terminal	-	-	7.5	Unknown
5018	A N½	I	Quartzite	Terminal	-	-	7.6	Unknown
5110	A N½	I	Quartzite	Terminal	-	33.0	7.8	Square Base
5146	A N½	I	Opaque Chert	Terminal	-	43.2	9.9	Square Base
5150	A N½	I	Quartzite	Terminal	-	33.9	7.8	Square Base
5151	A N½	I	Quartzite	Complete	49.4	42.7	9.8	Round Base
5162	A N½	I	Quartzite	Terminal	-	28.0	6.1	Square Base
5187	A N½	II	Opaque Chert	Terminal	-	33.1	7.9	Unknown

Note: All catalog numbers have the prefix SCL14.

Small Preforms

Thirty-eight complete specimens were grouped into the small preform category; 14 of these were recovered in two pieces, and in many cases, each half was found several meters apart. Using maxmium length compared to width of the implements, as well as overall shape, the preforms were further divided into five types. To facilitate classification, the length and width of each of these artifacts were plotted on the graph shown in Figure 14 and divided into types. Table 23 provides the charateristics of these bifaces by type and catalog number. Those listed with two catalog numbers were found in two pieces and were later refitted. The preforms are either acuminate or

Table 22. Crosstabulation of all preform types by material type, Taliaferro Site.

Preform Type		Translucent Chert	Opaque Chert	Quartzite	Whiskey Moss Agate	Buttes Chert	Obsidian	Church Buttes Chert	Total
Large Preform	#	0	9	33	0	0	0	0	42
	Row %	0	21.4	78.6	0	0	0	0	12.4
	Column %	0	10.0	68.6	0	0	0	0	
	Total %	0	2.7	9.8	0	0	0	0	
Small Preform Type I	#	6	1	0	0	2	0	0	9
	Row %	66.7	11.1	0	0	22.2	0	0	2.7
	Column %	3.4	1.1	0	0	14.3	0	0	
	Total %	1.8	0.3	0	0	0.6	0	0	
Small Preform Type IIa	#	9	3	0	0	0	0	0	12
	Row %	75.0	25.0	0	0	0	0	0	3.6
	Column %	5.1	3.3	0	0	0	0	0	
	Total %	2.7	0.9	0	0	0	0	0	
Small Preform Type IIb	#	7	2	0	0	0	2	0	11
	Row %	63.6	18.2	0	0	0	18.2	0	3.3
	Column %	4.0	2.2	0	0	0	40.0	0	
	Total %	2.1	0.6	0	0	0	0.6	0	
Small Preform Type III	#	4	1	0	0	0	0	0	5
	Row %	80.0	20.0	0	0	0	0	0	1.5
	Column %	2.3	1.1	0	0	0	0	0	
	Total %	1.2	0.3	0	0	0	0	0	
Small Preform Type IV	#	0	0	0	0	0	0	1	1
	Row %	0	0	0	0	0	0	100.0	0.3
	Column %	0	0	0	0	0	0	100.0	
	Total %	0	0	0	0	0	0	0.3	
Preform Proximal Fragments	#	65	23	4	2	5	1	0	100
	Row %	65.0	23.0	4.0	2.0	5.0	1.0	0	29.6
	Column %	36.9	25.6	8.3	50.0	35.7	20.0	0	
	Total %	19.2	6.8	1.2	0.6	1.5	0.3	0	
Preform Distal Fragments	#	74	41	8	2	6	2	0	133
	Row %	55.6	30.8	6.0	1.5	4.5	1.5	0	39.3
	Column %	42.0	45.6	16.7	50.0	42.9	40.0	0	
	Total %	21.9	12.1	2.4	0.6	1.8	0.6	0	
Preform Midsection Fragments	#	11	10	3	0	1	0	0	25
	Row %	44.0	40.0	12.0	0	4.0	0	0	7.4
	Column %	6.3	11.1	6.3	0	7.1	0	0	
	Total %	3.3	3.0	0.9	0	0.3	0	0	
Total	#	176	90	48	4	14	5	1	338
	%	52.1	26.6	14.2	1.2	4.1	1.5	0.3	100.0

lanceolate in shape and were manufactured by the bifacial reduction of small cobbles or flakes. The five types are described in more detail below.

Type I

Nine complete specimens are included in the Type I category (Figure 15 a-d): five are from the south half of Excavation Area A, one from the north half of Area A, and three from Area B. These specimens are long and relatively narrow and cluster fairly tightly at the right side of the length to width plot (Figure 14). All are lanceolate in shape and measure from 42.8 to 51.3 mm in length, 14.9 to 18.6 mm in width, and 1.3 to 5.3 mm in thickness (see Table 20). Material types include six of translucent algalitic chert, two of Whiskey Buttes chert, and one of opaque algalitic chert. Except for two specimens, all were found in two pieces.

Type IIa

Small preforms falling in the center of the length to width plot were divided into Types IIa and IIb based on maxmium width (Figure 14). The twelve with the narrower bases were assigned to the type IIa category (Figure 15 e-j). Six were recovered from the south half of Excavation Area A and the others are from Area B. These specimens have similar base widths as the Type I small preforms but are shorter in length (Table 20). They measure from 28.7 to 37.9 mm in length, 12.3 to 17.5 mm in width, and 2.2 to 4.8 mm in thickness and are mostly acuminate in shape. Nine are of translucent algalitic chert and three are of opaque algalitic chert. Five were refitted.

Type IIb

Eleven specimens were assigned to Type IIb small preforms (Figure 16 a-f). They generally fall in the center of the length to width plot (Figure 14); however, as can be seen in the plot, there is much variation within the size of this preform category which includes all specimens not clustering into other types. Measurements range from 21.0 to 36.6 mm in length, 15.9 to 22.5 mm in width, and 2.2 to 5.7 mm in thickness (Table 20). Seven are of translucent algalitic chert and two each of opaque algalitic chert and obsidian. They have generally an acuminate shape though some are much broader in relation to length than others.

Two specimens (SCL14.2060 and 2400) included here could perhaps be placed in a separate category (see Figure 16). They occur near the left side of the length to width plot and are almost as wide as they are long (Figure 14). Both were recovered from the south half of Excavation Area A and may be anomalies due to size of or flaws in the raw material. One was made from a small pebble of obsidian and the other from a small piece of translucent algalitic chert. Both exhibit small amounts of cortex on one surface.

Type III

The Type III category consists of five complete small preforms (Figure 16 g-j): three were from the south half of Excavation Area A and two were from Area B. Type III performs belong solely to the Late Prehistoric Components V and VI. They have wider bases than Types IIa and IIb and cluster fairly tightly in the upper center of the length to width plot (Figure 14). All are generally thicker than the other small preforms, as is evident by comparing the mean thickness of the various types (Table 20). They measure 31.8 to 36.9 mm in length, 23.4 to 26.8 mm in width, 4.6 to 7.4 mm in thickness, and are acuminate in shape. Except for one of opaque algalitic chert, all are of translucent algalitic chert. These preforms appear to

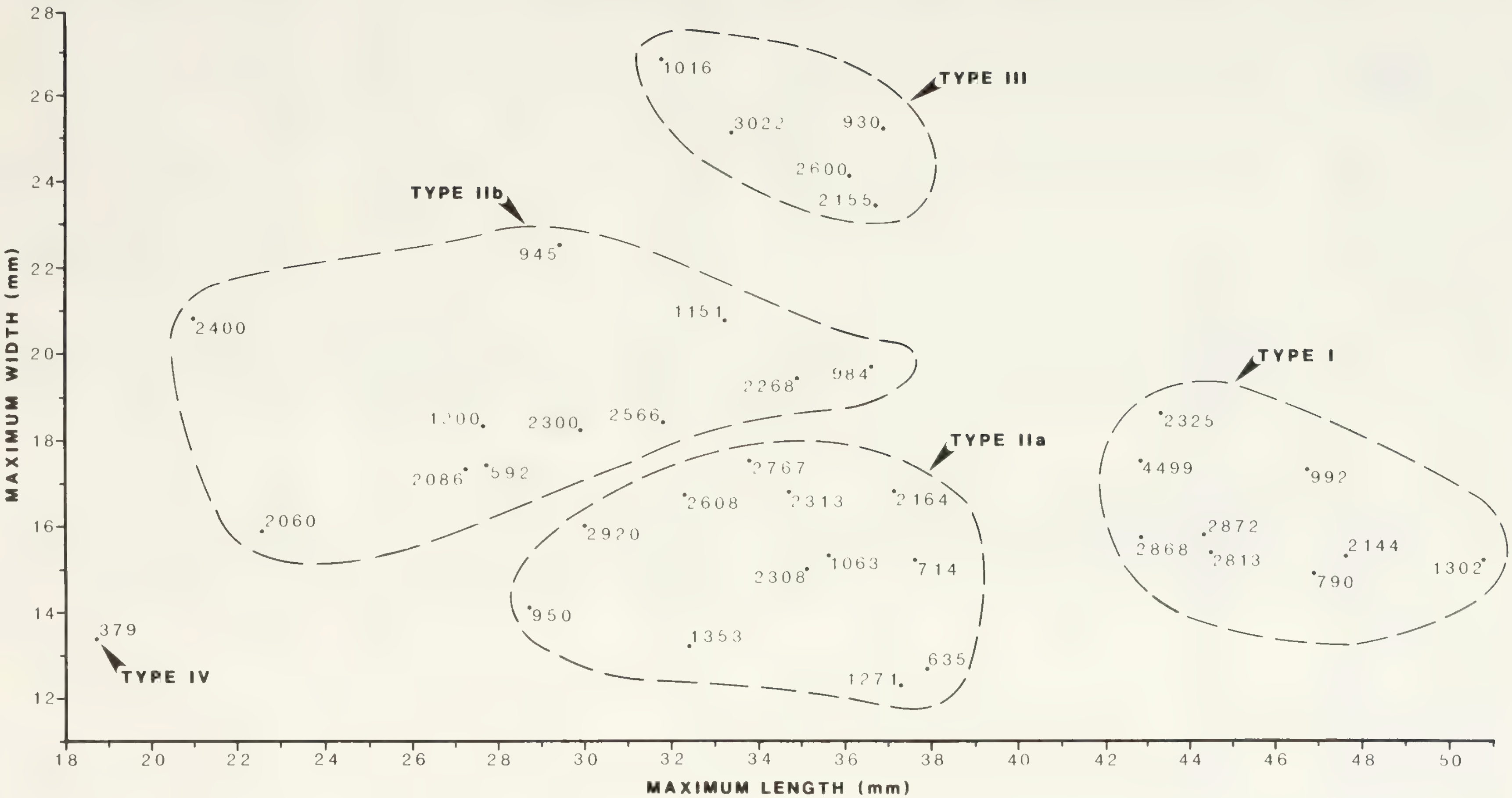


Figure 14. Plot of the length and width of the small performs showing grouping by type, Taliaferro site.

Table 23. Characteristics of small preform Types I, IIa, IIb, III, and IV by catalog number, Taliferro site.

Catalog Numbers	Excavation Area	Component	Material Type	Condition	Length (mm)	Width (mm)	Thickness (mm)	Shape
			Type I					
790, 1088	B	IV	Whiskey Buttes Chert	Complete	46.9	14.9	1.3	Lanceolate
992	B	IV	Opaque Chert	Complete	46.7	17.3	4.4	Lanceolate
1302, 1357	B	IV	Whiskey Buttes Chert	Complete	51.3	15.2	5.3	Lanceolate
2144, 2732	A S½	VI	Translucent Chert	Complete	47.6	15.3	3.6	Lanceolate
2325, 2870	A S½	VI	Translucent Chert	Complete	43.3	18.6	3.5	Lanceolate
2813	A S½	III	Translucent Chert	Complete	44.5	15.4	4.1	Lanceolate
2868, 2965	A S½	VI	Translucent Chert	Complete	42.8	15.7	2.8	Lanceolate
2872, 2757	A S½	VI	Translucent Chert	Complete	44.3	15.8	3.7	Lanceolate
4499, 4239	A N½	II	Translucent Chert	Complete	42.8	17.5	5.0	Lanceolate
			Type IIa					
635	B	V	Translucent Chert	Complete	37.9	12.6	5.8	Lanceolate
714, 776	B	VII	Translucent Chert	Complete	37.6	15.7	2.3	Acuminate
950	B	V	Translucent Chert	Complete	28.7	14.1	4.5	Acuminate
1063, 1092	B	IV	Translucent Chert	Complete	35.6	13.3	2.6	Acuminate
1271	B	IV	Opaque Chert	Complete	37.3	12.3	2.2	Acuminate
1353	B	IV	Opaque Chert	Complete	32.4	13.2	4.2	Lanceolate
2164, 2053	A S½	VI	Translucent Chert	Complete	37.1	16.8	4.0	Acuminate
2308, 2304	A S½	VI	Translucent Chert	Complete	35.1	15.0	4.2	Lanceolate
2313, 2312	A S½	III	Translucent Chert	Complete	34.7	16.8	2.9	Acuminate
2608, 2344	A S½	VI	Translucent Chert	Complete	32.3	16.7	2.7	Acuminate
2767	A S½	VI	Translucent Chert	Complete	33.7	17.5	3.3	Acuminate
2920	A S½	VI	Opaque Chert	Complete	30.0	16.0	4.8	Acuminate
			Type IIb					
592	B	VII	Obsidian	Complete	27.7	17.4	3.6	Acuminate
945	B	VII	Translucent Chert	Complete	29.4	22.5	3.3	Acuminate
984	B	V	Translucent Chert	Complete	36.6	19.7	5.7	Acuminate
1151	B	IV	Translucent Chert	Complete	33.2	20.8	5.4	Acuminate
1200	B	VII	Opaque Chert	Complete	27.6	18.3	4.3	Acuminate
2060	A S½	VI	Obsidian	Complete	22.6	15.9	2.2	Acuminate
2086, 2049	A S½	VI	Translucent Chert	Complete	27.2	17.3	2.2	Acuminate
2268	A S½	VI	Translucent Chert	Complete	34.9	19.4	3.3	Acuminate
2300	A S½	III	Translucent Chert	Complete	29.9	18.2	3.5	Acuminate

Table 23. Concluded.

Catalog Numbers	Excavation Area	Component	Material Type	Condition	Length (mm)	Width (mm)	Thickness (mm)	Shape
			Type IIb (Continued)					
2400	A S½	VI	Translucent Chert	Complete	21.0	20.8	5.3	Acuminate
2566	A S½	VI	Opaque Chert	Complete	31.8	18.4	4.9	Acuminate
			Type III					
930	B	V	Translucent Chert	Complete	36.9	25.2	7.1	Acuminate
1016	B	V	Opaque Chert	Complete	31.8	26.8	6.8	Acuminate
2155	A S½	VI	Translucent Chert	Complete	36.7	23.4	7.4	Acuminate
2600, 2897	A S½	VI	Translucent Chert	Complete	36.1	24.1	4.6	Acuminate
3022	A S½	VI	Translucent Chert	Complete	33.4	25.1	6.5	Acuminate
			Type IV					
379	B	VII	Church Buttes	Complete	18.7	13.4	2.2	Acuminate

Note: All catalog numbers have the prefix SCL14.

belong to a reduction stage slightly preceding the other types and were probably discarded before completion due to flaws in the raw material or breakage.

Type IV

One specimen was different enough from the others to warrent a separate type (Figure 16k). It is by far the smallest preform recovered during the excavations (Figure 14) and is more finely worked than most. Found in Excavation Area B, it measures 18.7 x 13.4 x 2.2 mm, has a acuminate shape, and is the only preform made from Church Buttes chert. It is about the size and shape of the Desert Side-notched or Tri-notched projectile points but lacks the notches. In the Great Basin similiar artifacts are referred to as Cottonwood projectile points (Heizer and Hester 1978).

Preform Fragments

The remaining 258 preforms are too fragmentary for classfication into the above categories. Most are incomplete small preforms that lack a length measurement for inclusion into one of the five types. A few small pieces of the distal portion of the large preforms are also included here. Table 24 details the excavation area, component, and material type for each of the proximal, distal, and midsection fragments by catalog number.

Of the 258 preform fragments, 100 are proximal portions, 133 are distal portions, and 25 are midsections. Over half of these fragments are of translucent algalitic chert while the second most common material is opaque

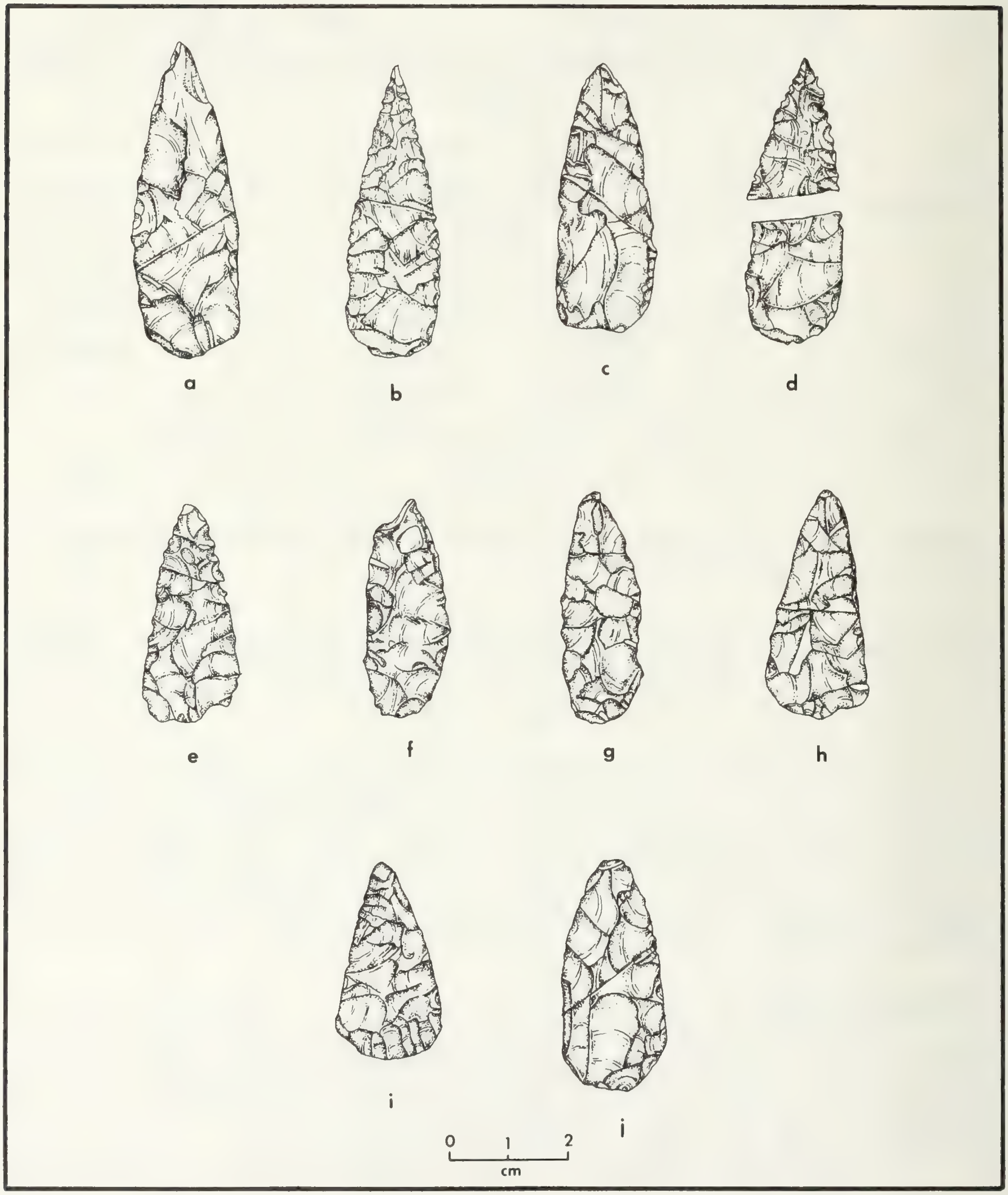


Figure 15. Selected small preform Types I and IIa from the Taliaferro site. a-d, Type I; e-j, Type IIa. Provenience: Component IV, a. SCL14.1302, 1357, e. SCL14.1063, 1092, f. SCL14.1271; Component V, g. SCL14.635; Component VI, b. SCL14.2144, 2732, c. SCL14.2757, 2872, d. SCL14.2868, 2965, h. SCL14.2053, 2164, i. SCL14.2344, 2608; Component VII, j. SCL14.714, 776.

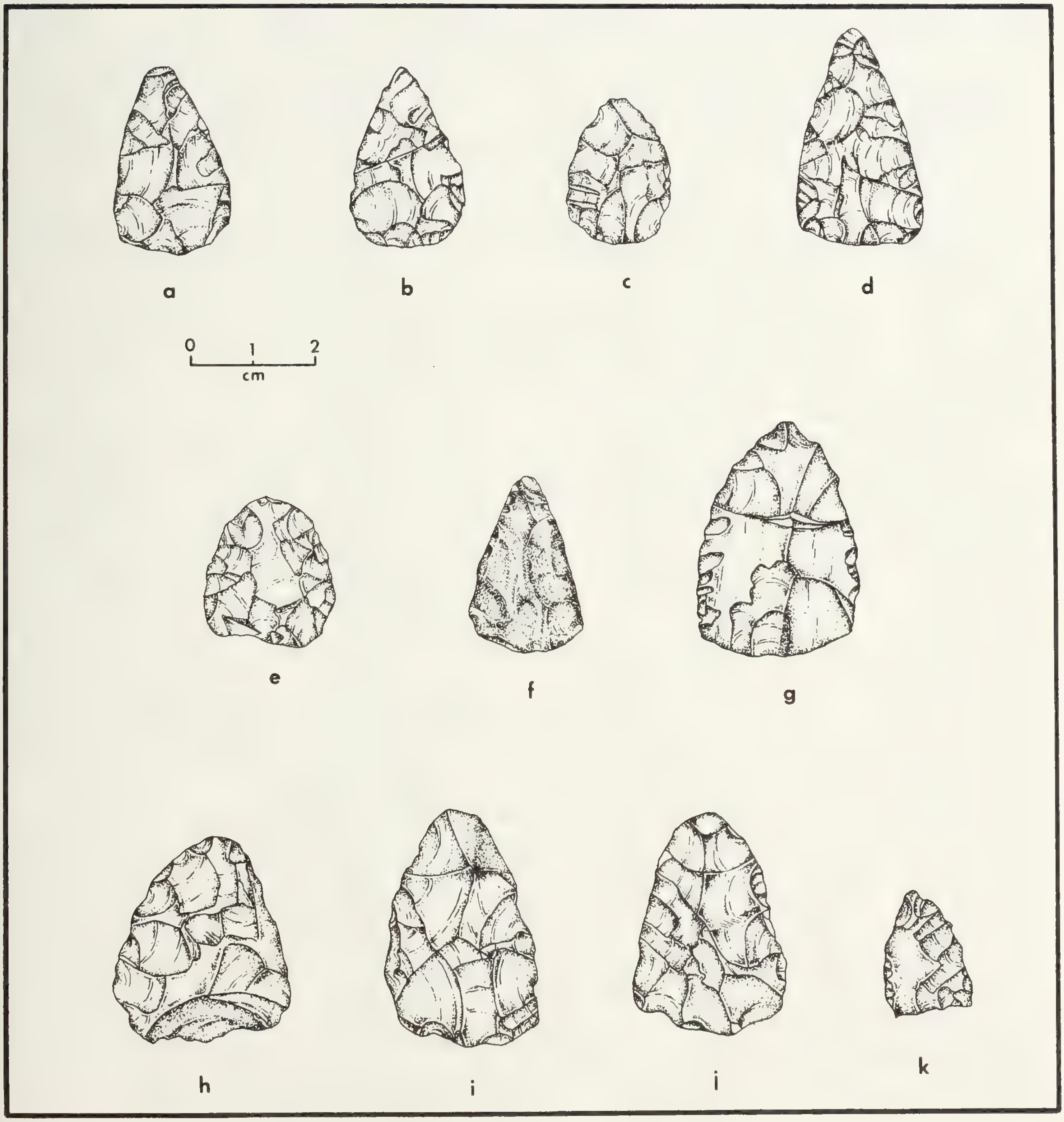


Figure 16. Selected small preform Types IIb, III, and IV from the Taliaferro site. a-f, Type IIb; g-j, Type III; k, Type IV. Provenience: Component III, a. SCL14.2300, Component V, g. SCL14.930, h. SCL14.1016; Component VI, b. SCL14.2086, 2049, c. SCL14.2060, d. SCL14.2268, e. SCL14.2400, i. SCL14.2155, j. SCL14.2600, 2897; Component VII, f. SCL14.592, k. SCL14.379.

algalitic chert (Table 22). The remaining ones are distributed, in small quantities, among quartzite, moss agate, Whiskey Buttes chert, and obsidian.

Comparisons of Preforms by Components

In addition to the above descriptions, comparisons were made of the size, material, and preform type by cultural components. This will enable a discussion of the differences through time of these attributes. A crosstabulation of material type by component is shown in Table 25. As is evident in the table, Component I is dominated by quartzite preforms with 14 or 66.7% of the total. In Component II, quarzite at 38.9% is slightly dominant over opaque and translucent algalitic chert. Opaque algalitic chert is the most common material at 41.9% in Component III. Over half the preforms from each of the four Late Prehistoric Components IV-VII are translucent algalitic chert.

The chi-square test was used to examine if these observed differences in the raw material types of the preforms for the three Archaic components and the Late Prehistoric are significant. The data for the four Late Prehistoric components were combined for the test, which was conducted under the null hypotesis of no difference in material types with respect to component (.05 alpha level for rejection). The computed chi-square was 93.07 with 18 degrees of freedom and signifciant at the .0001 level. The Cramer's V value was .30297. A significant difference occurs in the material types in relation to cultural components.

The mean, standard deviation, and variance of the length, width, and thickness measurements of the preforms, except fragments, were computed for each component (Table 26). As with the other artifact classes, the Kruskal-Wallis one-way analysis of variance test was used to statistically measure whether differences in the size of these artifacts exist between components. The length, width, and thickness measurements were tested under the null hypothesis of no differences between the components to be rejected at the .05 alpha level. The H value was 14.742 significant at the .022 level for the length measurements, 25.25 significant at the .0001 level for the width, and 32.245 significant at the .0001 level for the thickness. Given these figures, statistically there are significant differences in size by component. An examination of the mean measurements on Table 26 indicates that the preforms from the Archaic components are larger than the ones from the Late Prehistoric, and those in Component I are by far the largest.

A final crosstabulation was performed between preform type and cultural component (Table 27). Again, the chi-square test was used to see if there are significant differences. The null hypothesis was that of no difference between the components to be rejected at the .05 alpha level. The chi-square value was 53.95 with 30 degrees of freedom and significant at the .0046 level. The Cramer's V was computed at .36728, indicating a stronger relationship than the crosstabulation for material type by component. Significant differences exist in the preform types with respect to component. The chi-square test conducted without Component VI, a component containing a mixture of more than one Late Prehistoric occupation, yielded a value of 47.76 significant at the .004 level. The Cramer's V of .40583 indicates even a stronger correspondence between preform type and component than when Component VI was included.

As Table 27 clearly shows, large preforms dominant in the three Archaic components and is the only type represented in Component I; however, they are also common in the Late Prehistoric components. Ignoring Component VI, which contains material from several Late Prehistoric occupations, the majority of the Type I small preforms are in Component IV with others present in

Table 24. Characteristics of the preform proximal, distal, and midsection fragments by catalog number, Taliaferro site.

Catalog Number	Excavation Area	Component	Material Type
		Proximal Portions	
229	B	VII	Translucent Chert
227	B	VII	Opaque Chert
251	B	VII	Translucent Chert
271	B	VII	Translucent Chert
312	B	VII	Translucent Chert
354	B	VII	Translucent Chert
373	B	V	Translucent Chert
390	B	VII	Translucent Chert
392	B	V	Translucent Chert
444	B	V	Translucent Chert
481	B	VII	Whiskey Buttes Chert
499	B	VII	Translucent Chert
505	B	V	Translucent Chert
524	B	V	Translucent Chert
545	B	VII	Translucent Chert
556	B	VII	Translucent Chert
562	B	VII	Translucent Chert
578	B	VII	Translucent Chert
589	B	VII	Opaque Chert
581	B	VII	Opaque Chert
597	B	IV	Translucent Chert
631	B	VII	Opaque Chert
641	B	V	Translucent Chert
661	B	V	Opaque Chert
662	B	V	Translucent Chert
668	B	V	Translucent Chert
679	B	V	Translucent Chert
730	B	V	Translucent Chert
735	B	V	Whiskey Buttes Chert
829	B	VII	Opaque Chert
782	B	IV	Translucent Chert
784	B	IV	Translucent Chert
892	B	VII	Translucent Chert
1290	B	V	Translucent Chert
1291	B	VII	Opaque Chert
1309	B	V	Translucent Chert
1335	B	V	Translucent Chert
1347	B	IV	Translucent Chert
1369	B	IV	Translucent Chert
1416	B	VII	Opaque Chert
2044	A S½	VI	Opaque Chert
2054	A S½	VI	Translucent Chert
2094	A S½	VI	Translucent Chert
2157	A S½	VI	Translucent Chert
2203	A S½	VI	Translucent Chert
2247	A S½	VI	Translucent Chert
2294	A S½	VI	Translucent Chert
2311	A S½	III	Translucent Chert
2427	A S½	VI	Quartzite
2515	A S½	VI	Translucent Chert
2535	A S½	VI	Translucent Chert
2540	A S½	VI	Translucent Chert
2567	A S½	VI	Translucent Chert
2599	A S½	VI	Translucent Chert
2602	A S½	VI	Translucent Chert
2603	A S½	VI	Translucent Chert
2656	A S½	VI	Translucent Chert
2739	A S½	VI	Translucent Chert
2742	A S½	III	Opaque Chert
2784	A S½	III	Opaque Chert
2794	A S½	VI	Translucent Chert
2806	A S½	VI	Translucent Chert
2829	A S½	VI	Translucent Chert
2867	A S½	VI	Opaque Chert
2873	A S½	VI	Translucent Chert

Table 24. Continued.

Catalog Number	Excavation Area	Component	Material Type
Proximal Portions (Continued)			
2888	A S½	VI	Translucent Chert
944	B	V	Translucent Chert
969	B	V	Opaque Chert
981	B	V	Whiskey Buttes Chert
1005	B	V	Translucent Chert
1041	B	V	Translucent Chert
1070	B	V	Translucent Chert
1075	B	V	Translucent Chert
1087	B	IV	Translucent Chert
1120	B	V	Opaque Chert
1121	B	V	Opaque Chert
1152	B	IV	Translucent Chert
1184	B	V	Translucent Chert
1228	B	V	Whiskey Buttes Chert
1229	B	V	Translucent Chert
1219	B	V	Quartzite
1254	B	V	Translucent Chert
1269	B	IV	Translucent Chert
2942	A S½	VI	Opaque Chert
2979	A S½	VI	Translucent Chert
3032	A S½	III	Opaque Chert
3038	A S½	VI	Translucent Chert
3089	A S½	III	Opaque Chert
3101	A S½	VI	Opaque Chert
3103	A S½	VI	Moss Agate
3125	A S½	III	Opaque Chert
4165	A N½	II	Opaque Chert
4238	A N½	II	Obsidian
4365	A N½	III	Opaque Chert
4385	A N½	III	Opaque Chert
4399	A N½	III	Whiskey Buttes Chert
4501	A N½	II	Moss Agate
4632	A N½	I	Quartzite
5117	A S½	I	Translucent Chert
5205	A N½	I	Quartzite
Distal Portions			
224	B	VII	Translucent Chert
226	B	VII	Opaque Chert
228	B	VII	Translucent Chert
233	B	VII	Translucent Chert
249	B	VII	Translucent Chert
283	B	VII	Opaque Chert
291	B	VII	Opaque Chert
294	B	VII	Translucent Chert
327	B	VII	Opaque Chert
339	B	VII	Translucent Chert
359	B	VII	Translucent Chert
360	B	VII	Translucent Chert
362	B	VII	Opaque Chert
389	B	VII	Translucent Chert
393	B	VII	Translucent Chert
394	B	VII	Translucent Chert
901	B	V	Whiskey Buttes Chert
908	B	VII	Opaque Chert
917	B	V	Opaque Chert
929	B	V	Translucent Chert
965	B	V	Opaque Chert
968	B	V	Translucent Chert
985	B	V	Translucent Chert
1007	B	V	Translucent Chert
1024	B	VII	Translucent Chert
1033	B	VII	Opaque Chert
1042	B	V	Opaque Chert
1046	B	V	Translucent Chert
1051	B	V	Opaque Chert
1053	B	V	Translucent Chert
1060	B	IV	Opaque Chert
1073	B	IV	Opaque Chert
1080	B	IV	Translucent Chert

Table 24. Continued.

Catalog Number	Excavation Area	Component	Material Type
			Distal Portions (Continued)
402	B	VII	Translucent Chert
421	B	VII	Translucent Chert
430	B	V	Translucent Chert
438	B	VII	Opaque Chert
446	B	VII	Translucent Chert
471	B	VII	Translucent Chert
473	B	VII	Translucent Chert
502	B	VII	Translucent Chert
507	B	VII	Opaque Chert
540	B	VII	Translucent Chert
541	B	VII	Translucent Chert
555	B	VII	Opaque Chert
586	B	V	Whiskey Buttes Chert
598	B	IV	Opaque Chert
601	B	VII	Translucent Chert
615	B	IV	Translucent Chert
630	B	VII	Translucent Chert
652	B	V	Translucent Chert
664	B	V	Opaque Chert
691	B	V	Quartzite
696	B	V	Translucent Chert
709	B	VII	Opaque Chert
728	B	VII	Translucent Chert
729	B	V	Opaque Chert
739	B	V	Translucent Chert
741	B	IV	Opaque Chert
783	B	V	Translucent Chert
789	B	IV	Opaque Chert
836	B	VII	Opaque Chert
844	B	VII	Quartzite
848	B	VII	Whiskey Buttes Chert
875	B	VII	Opaque Chert
884	B	VII	Translucent Chert
893	B	VII	Opaque Chert
2609	A S½	VI	Opaque Chert
2618	A S½	VI	Obsidian
2639	A S½	VI	Translucent Chert
1089	B	IV	Whiskey Buttes Chert
1097	B	IV	Opaque Chert
1117	B	V	Opaque Chert
1123	B	V	Translucent Chert
1140	B	V	Translucent Chert
1168	B	VII	Moss Agate
1201	B	VII	Translucent Chert
1247	B	VII	Translucent Chert
1298	B	IV	Opaque Chert
1332	B	V	Translucent Chert
1348	B	V	Quartzite
1350	B	V	Translucent Chert
1361	B	V	Translucent Chert
1362	B	IV	Translucent Chert
1375	B	IV	Translucent Chert
1399	B	IV	Translucent Chert
1457	B	VII	Translucent Chert
2045	A S½	VI	Translucent Chert
2081	A S½	VI	Translucent Chert
2140	A S½	VI	Translucent Chert
2156	A S½	VI	Translucent Chert
2196	A S½	VI	Opaque Chert
2295	A S½	VI	Translucent Chert
2296	A S½	VI	Translucent Chert
2399	A S½	VI	Translucent Chert
2407	A S½	VI	Translucent Chert
2425	A S½	III	Whiskey Buttes Chert
2470	A S½	VI	Translucent Chert
2476	A S½	VI	Quartzite
2505	A S½	VI	Translucent Chert
2556	A S½	VI	Translucent Chert
2579	A S½	VI	Opaque Chert
2598	A S½	VI	Translucent Chert

Table 24. Concluded.

Catalog Number	Excavation Area	Component	Material Type
Distal Portions (Continued)			
2686	A S½	III	Translucent Chert
2711	A S½	VI	Translucent Chert
2869	A S½	VI	Translucent Chert
2874	A S½	VI	Translucent Chert
2947	A S½	VI	Opaque Chert
2955	A S½	VI	Translucent Chert
3078	A S½	III	Opaque Chert
3084	A S½	III	Opaque Chert
3102	A S½	III	Quartzite
3105	A S½	VI	Translucent Chert
3116	A S½	III	Translucent Chert
3118	A S½	III	Quartzite
3136	A S½	III	Translucent Chert
3200	A S½	III	Translucent Chert
4020	A N½	VI	Opaque Chert
4038	A N½	III	Opaque Chert
4061	A N½	III	Translucent Chert
4100	A N½	II	Translucent Chert
4201	A N½	II	Opaque Chert
4240	A N½	II	Translucent Chert
4333	A N½	II	Translucent Chert
4352	A N½	III	Quartzite
4359	A N½	VI	Translucent Chert
4404	A N½	III	Opaque Chert
4661	A N½	II	Opaque Chert
4759	A N½	I	Obsidian
4843	A N½	I	Moss Agate
4898	A N½	I	Whiskey Buttes Chert
5019	A N½	I	Quartzite
5235	A N½	I	Opaque Chert
Midsection Portions			
252	B	VII	Translucent Chert
338	B	VII	Opaque Chert
380	B	VII	Opaque Chert
414	B	V	Opaque Chert
432	B	I	Translucent Chert
447	B	VII	Quartzite
506	B	V	Quartzite
523	B	V	Opaque Chert
616	B	IV	Opaque Chert
665	B	V	Translucent Chert
667	B	V	Translucent Chert
816	B	IV	Whiskey Buttes Chert
843	B	VII	Opaque Chert
847	B	VII	Quartzite
1003	B	V	Opaque Chert
1032	B	VII	Translucent Chert
1059	B	IV	Translucent Chert
1065	B	IV	Translucent Chert
1107	B	IV	Opaque Chert
1164	B	VII	Translucent Chert
1166	B	VII	Translucent Chert
1176	B	VII	Translucent Chert
2303	A S½	VI	Translucent Chert
2693	A S½	VI	Opaque Chert
2809	A S½	VI	Opaque Chert

Note: All catalog numbers have the prefix SCL14.

Table 25. Crosstabulation of preforms by component and material type, Taliaferro site.

Component		Translucent Chert	Opaque Chert	Quartzite	Moss Agate	Whiskey Buttes Chert	Obsidian	Church Buttes Chert	Total
I	#	1	3	14	1	1	1	0	21
	Row %	4.8	14.3	66.7	4.8	4.8	4.8	0	6.2
	Column %	.6	3.3	29.2	25.0	7.1	20.0	0	
	Total %	.3	.9	4.1	.3	.3	.3	0	
II	#	4	5	7	1	0	1	0	18
	Row %	22.2	27.8	38.9	5.6	0	5.6	0	5.3
	Column %	2.3	5.6	14.6	25.0	0	20.0	0	
	Total %	1.2	1.5	2.1	.3	0	.3	0	
III	#	9	13	7	0	2	0	0	18
	Row %	29.0	41.9	22.6	0	6.5	0	0	9.2
	Column %	5.1	14.4	14.6	0	14.3	0	0	
	Total %	2.7	3.8	2.1	0	.6	0	0	
IV	#	17	12	1	0	4	0	0	34
	Row %	50.0	35.3	2.9	0	11.8	0	0	10.1
	Column %	9.7	13.3	2.1	0	28.6	0	0	
	Total %	5.0	3.6	.3	0	1.2	0	0	
V	#	43	17	7	0	5	0	0	72
	Row %	59.7	23.6	9.7	0	6.9	0	0	21.3
	Column %	24.4	18.9	14.6	0	35.7	0	0	
	Total %	12.7	5.0	2.1	0	1.5	0	0	
VI	#	56	14	6	1	0	2	0	79
	Row %	70.9	17.7	7.6	1.3	0	2.5	0	23.4
	Column %	31.8	15.6	12.5	25.0	0	40.0	0	
	Total %	16.6	4.1	1.8	.3	0	.6	0	
VII	#	46	26	6	1	2	1	1	83
	Row %	55.4	31.3	7.2	1.2	2.4	1.2	1.2	24.6
	Column %	26.1	28.9	12.5	25.0	14.3	20.0	100.0	
	Total %	13.6	7.7	1.8	.3	.6	.3	.3	
Total	#	176	90	48	4	14	5	1	338
	%	52.1	26.6	14.2	1.2	4.1	1.5	.3	100.0

Components II and III. Types IIa and IIb small preforms are distributed from Component III to VII with the latter dominating in Component VII and the other most common in Components IV and V. Type III small preforms occur in Component V, and the only Type IV preform is in Component VII.

Overall, through time from earliest to latest, favored material types change from quartzite in the Early Archaic Component I to opaque algalitic chert and then to translucent algalitic chert by the Late Prehistoric period. The size of the preforms decrease through time. This also applies to the blanks, and in part, to the preblanks. The reliance on quartzite in the earlier periods for the larger artifacts is probably the result of the larger size of these cobbles in the site vicinity; few chert cobbles are large enough to produce large preforms. Translucent algalitic chert was chosen for the small artifacts in the Late Prehistoric because of its superior fracturing properties.

Table 26. The mean, standard deviation, and variance of the length, width, and thickness of preforms by component, Taliaferro site.

	Component							
	I	II	III	IV	V	VI	VII	Total
				Length (mm)				
Number	3	1	4	7	5	17	5	42
Mean	68.4	42.8	46.5	40.4	34.3	34.7	28.2	38.5
Standard Deviation	8.6	0	21.2	7.6	3.9	7.2	6.7	12.8
Variance	74.6	0	449.6	58.1	15.6	52.4	45.1	165.5
				Width (mm)				
Number	12	7	9	8	10	21	8	75
Mean	39.7	30.9	27.0	17.9	31.7	21.7	25.7	27.4
Standard Deviation	9.0	6.8	9.5	8.1	13.9	7.7	11.8	11.5
Variance	82.3	46.9	90.8	65.8	194.5	59.9	140.7	132.9
				Thickness (mm)				
Number	13	9	9	8	10	22	9	80
Mean	8.8	6.9	5.9	3.9	5.9	4.6	4.6	5.8
Standard Deviation	2.6	1.4	2.2	1.7	1.3	1.8	1.9	2.4
Variance	7.0	1.3	5.1	3.1	1.8	3.5	3.9	6.1

Drills

Bifacially flaked tools characterized by long, narrow distal ends, or bits, were classified as drills. The bits of these implements have thick to thin biconvex cross sections and parallel lateral margins which form a point. Most exhibit fine retouch along these margins. Many have rounded, flared bases while others are characterized by no break in the lateral margins from tip to proximal end. The term drill for this category is used to describe a morphological form and does not necessarily imply function.

Eleven drills were recovered from the Taliaferro site (Figure 17 a-h); seven are from Excavation Area A and four were found in Area B. Table 28 lists the characteristics of these artifacts by catalog number. The width measurements were taken at the widest portion of the base. The type of base is listed under Shape. Translucent and opaque algalitic chert are represented by five specimens each, and the remaining one is of Whiskey Buttes chert (Table 29). This table also shows the material type of the drills broken down by component. The majority, nine of the eleven, were recovered from components dating to the Late Prehistoric period.

Of the three drills that have rounded bases, two are from Component VI and one is from Component V. They are incomplete, lack tips, and measure 18.8, 18.9, and 19.0 mm in width. Another three are drills without pronouced bases that belong to the Late Prehistoric Components V, VI, and VII. One is complete (SCL14.3046; Figure 17f) and measures 33.6 x 7.0 x 2.4 mm. The other two are without tips. Of these, one (SCL14.579; Figure 17g) is small and thin with the proximal end measuring 7.2 mm in width and the other (SCL14.1185; Figure 17b) is relatively thick in cross section with a maximium width of 15.0 mm.

Table 27. Crosstabulation of preform type by component, Taliaferro site.

Component		Large Preform	Small Preform Types: Type I	Type IIa	Type IIb	Type III	Type IV	Total
I	#	13	0	0	0	0	0	13
	Row %	100.0	0	0	0	0	0	16.2
	Column %	31.0	0	0	0	0	0	
	Total %	16.2	0	0	0	0	0	
II	#	8	1	0	0	0	0	9
	Row %	88.9	11.1	0	0	0	0	11.2
	Column %	19.0	11.1	0	0	0	0	
	Total %	10.0	1.2	0	0	0	0	
III	#	6	1	1	1	0	0	9
	Row %	66.7	11.1	11.1	11.1	0	0	11.2
	Column %	14.3	11.1	8.3	9.1	0	0	
	Total %	7.5	1.2	1.2	1.2	0	0	
IV	#	1	3	3	1	0	0	8
	Row %	12.5	37.5	37.5	12.5	0	0	10.0
	Column %	2.4	33.3	25.0	9.1	0	0	
	Total %	1.2	3.7	3.7	1.2	0	0	
V	#	5	0	2	1	2	0	10
	Row %	50.0	0	20.0	10.0	20.0	0	12.5
	Column %	11.9	0	16.7	9.1	40.0	0	
	Total %	6.3	0	2.5	1.2	2.5	0	
VI	#	5	4	5	5	3	0	22
	Row %	22.7	18.2	22.7	22.7	13.6	0	17.5
	Column %	11.9	44.4	41.7	45.5	60.0	0	
	Total %	6.3	5.0	6.3	6.3	3.7	0	
VII	#	4	0	1	3	0	1	9
	Row %	44.4	0	11.1	33.3	0	11.1	11.2
	Column %	9.5	0	8.3	27.3	0	100.0	
	Total %	5.0	0	1.2	3.7	0	1.2	
Total	#	42	9	12	11	5	1	80
	%	52.5	11.2	15.0	13.7	6.3	1.2	100.0

A complete drill (SCL14.871; Figure 17h) from Component VII exhibits three notches; one is on each of the lateral margins, and the other is on the center of the proximal edge. It was probably a small preform which was notched and reworked at the tip. The drill (SCL14.5179; Figure 17a) from the Early Archaic Compoment I is a fragment which lacks a portion of the base as well as the tip. This specimen appears to have been originally a large, side notched projectile point that was broken at the notches and resharpened into a drill. The remaining three drills are distal fragments, two from Component VI and one from the Late Archaic Component III.

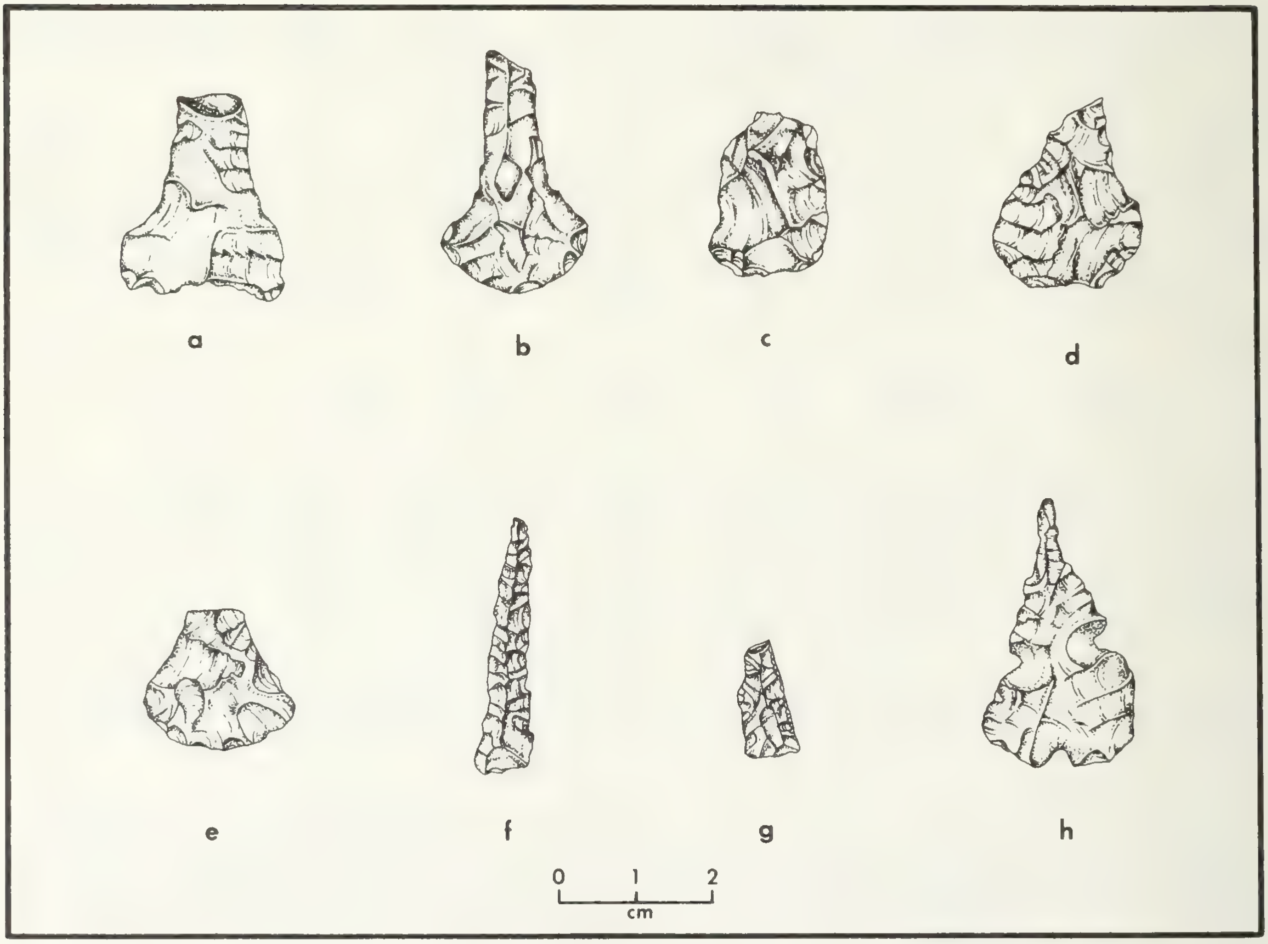


Figure 17. Selected drills from the Taliaferro site. Provenience: Component I, a. SCL14.5179; Component V, a. SCL14.1333, c. SCL14.1185; Component VI, d. SCL14.2353, e. SCL14.2637, f. SCL14.3046; Component VII, g. SCL14.579, h. SCL14.871.

Table 28. Characteristics of drills and large, notched knives by catalog number, Taliaferro site.

Catalog Number	Excavation Area	Component	Material Type	Condition	Shape	Length (mm)	Width (mm)	Thickness (mm)	Base Width	Neck Width	Stem Length
Drills											
579	B	VII	Translucent Chert	Proximal	No pronounced base	-	7.2	2.8	-	-	-
871	B	VII	Opaque Chert	Complete	Tri-notched base	33.3	20.0	4.3	-	-	-
1185	B	V	Translucent Chert	Proximal	No pronounced base	-	15.0	7.4	-	-	-
1333	B	V	Opaque Chert	Proximal	Rounded base	-	18.8	4.3	-	-	-
2353	A S½	VI	Translucent Chert	Proximal	Rounded base	-	19.0	2.9	-	-	-
2570	A S½	VI	Opaque Chert	Distal	Unknown	-	-	-	-	-	-
2637	A S½	VI	Translucent Chert		Rounded base	-	18.9	3.8	-	-	-
3046	A S½	VI	Opaque Chert	Complete	No pronounced base	33.6	7.0	2.4	-	-	-
3222	A S½	III	Translucent Chert	Distal	Unknown	-	-	-	-	-	-
4015	A N½	VI	Whiskey Buttes Chert	Distal	Unknown	-	-	-	-	-	-
5179	A N½	I	Opaque Chert	Proximal	Unknown	-	20.6		4.6	-	-
Large Notched Knives											
2048	A S½	VI	Opaque Chert	Proximal	Corner-notched base	-	7.3	-	15.2		14.2
2349	A S½	VI	Opaque Chert	Distal	Corner-notched base	42.4	7.2	-	19.1	-	
2966	A S½	VI	Opaque Chert	Proximal	Corner-notched base	41.7	9.1	29.4	22.1	24.0	
3177	A S½	VI	Opaque Chert	Complete	Corner-notched base	49.9	26.7	6.0	20.7	13.6	12.4
4362	A N½	VI	Opaque Chert	Proximal	Corner-notched base	22.6	5.0	17.7	13.3	10.2	

Note: All catalog numbers have the prefix SCL14.

Table 29. Crosstabulation of drills by component and material type, Taliaferro site.

Component		Material Type: Translucent Chert	Opaque Chert	Whiskey Buttes Chert	Total
I	#	0	1	0	1
	Row %	0	100.0	0	9.1
	Column %	0	20.0	0	
	Total %	0	9.1	0	
III	#	1	0	0	1
	Row %	100.0	0	0	9.1
	Column %	20.0	0	0	
	Total %	9.1	0	0	
V	#	1	1	0	2
	Row %	50.0	50.0	0	18.2
	Column %	20.0	20.0	0	
	Total %	9.1	9.1	0	
VI	#	2	2	1	5
	Row %	40.0	40.0	20.0	45.5
	Column %	40.0	40.0	100.0	
	Total %	18.2	18.2	9.1	
VII	#	1	1	0	2
	Row %	50.0	50.0	0	18.2
	Column %	20.0	20.0	0	
	Total %	9.1	9.1	0	
Total	#	5	5	1	11
	%	45.5	45.5	9.1	100.0

Large Notched Knives

The Large Notched Knives category includes large, bifacially reduced final tools displaying notches. They are generally much larger than the notched artifacts grouped as projectile points and exhibit fine retouch along the margins. They are seperated from projectile points because of their large size, absence of impact fractures common on projectile points, and presence of use scars on blade edges.

Five specimens, all from Late Prehistoric Component VI in Excavation Area A, are classified as large, notched knives (Figure 18 a-e). All have corner notches, are of opaque chert, and except for one, are broken. Table 28 lists the characteristics including measurements of the specimens in this class. The complete specimen (SCL14.3177; Figure 18d), one of the smallest of the five, measures 49.9 x 26.7 x 6.0 mm. The notched knife (SCL14.2966; Figure 18b) with the largest remaining basal portion is 41.7 mm long and is 29.4 mm wide at the base. Another specimen (SCL14.4362; Figure 18e) has asymetrical corner notches and fairly straight margins. One large blade fragment (SCL14.2349; Figure 18a) is broken at the notches, lacks the base, and measures 42.4 mm wide with a blade 84.7 mm long. The final corner notched basal fragment (SCL14.2048; Figure 18c) is broken along both margins and is missing a portion of the base.

Final Biface Fragments

Final biface fragments include midsection and distal fragments that display fine retouch along the margins. Most appear to be portions of projectile points or other final tools that lack the diagnostic base for classification. None fit the projectile point bases recovered at the site.

Forty-seven final biface fragments were found during the excavations: 18 are from the south half of Excavation Area A, 5 are from the north half of Area A, and 24 are from Area B. The chacteristics of these artifacts, including component, material type, and condition, are listed in Table 30. Of these fragments, 42 are tips and 5 are midsections.

Table 31 details the crosstabulation of the fragments by component and material type. Material types include 30 of translucent algalitic chert, 13 of opaque algalitic chert, and 4 of quartzite. Most, 38, belong to the Late Prehistoric Components IV-VII. Two others are associated with the Early Arachic Component I, and the remaining four are from the Late Archaic Component III.

Indeterminate Bifaces

Bifacially reduced artifacts that are too small and fragmentary for inclusion into other categories were classified as indeterminate bifaces. Most appear to be small fragments of broken preblanks and blanks. A total of 84 was recovered from the site: 10 from the south half of Excavation Area A, 26 from the north half of Area A, and 48 from Area B. Table 32 provides the component and material type of each fragment by catalog number.

A crosstabulation of component by material type also was computed for the indeterminate bifaces (Table 33). The dominant material type, translucent algalitic chert, is represented by 49 specimens, or 58.3% of the total. In order of dominance, opaque algalitic chert, quartzite, Whiskey Buttes chert, and obsidian also are present. The majority occur in the Late Prehistoric Component VII with 36 fragments. Another 25 are distributed among the other three Late Prehistoric components. The remaining 23 belong to the three Archaic components.

Projectile Points

Except for the six large, notched knives, bifacially flaked stone tools displaying notches or other modification for hafting were classified as projectile points. Using morphological attributes, including overall size, form of notch, and shape of base, the projectile points were divided into several types which have, to some degree, chronological distinction. A total of 118 projectile points was recovered during the excavations. Of these, 39 were grouped as large points and the other 79 were classified as small points based on overall size. The large points were probably hafted on darts or spears while the small points were used on arrows.

Because southwest Wyoming encompasses a high basin of the Middle Rocky Mountain physiographic province located between the Great Basin, the Northern Colorado Plateau, and the Great Plains, reports containing named point types from sites in these regions were consulted for comparisons. The extant literature reveals much confusion concerning the names of points with similar morphological shapes and chronological occurrences between the regions. This becomes a problem when attempting to assign names to point types found in the intermediate area. Applying traditional names for one region with the

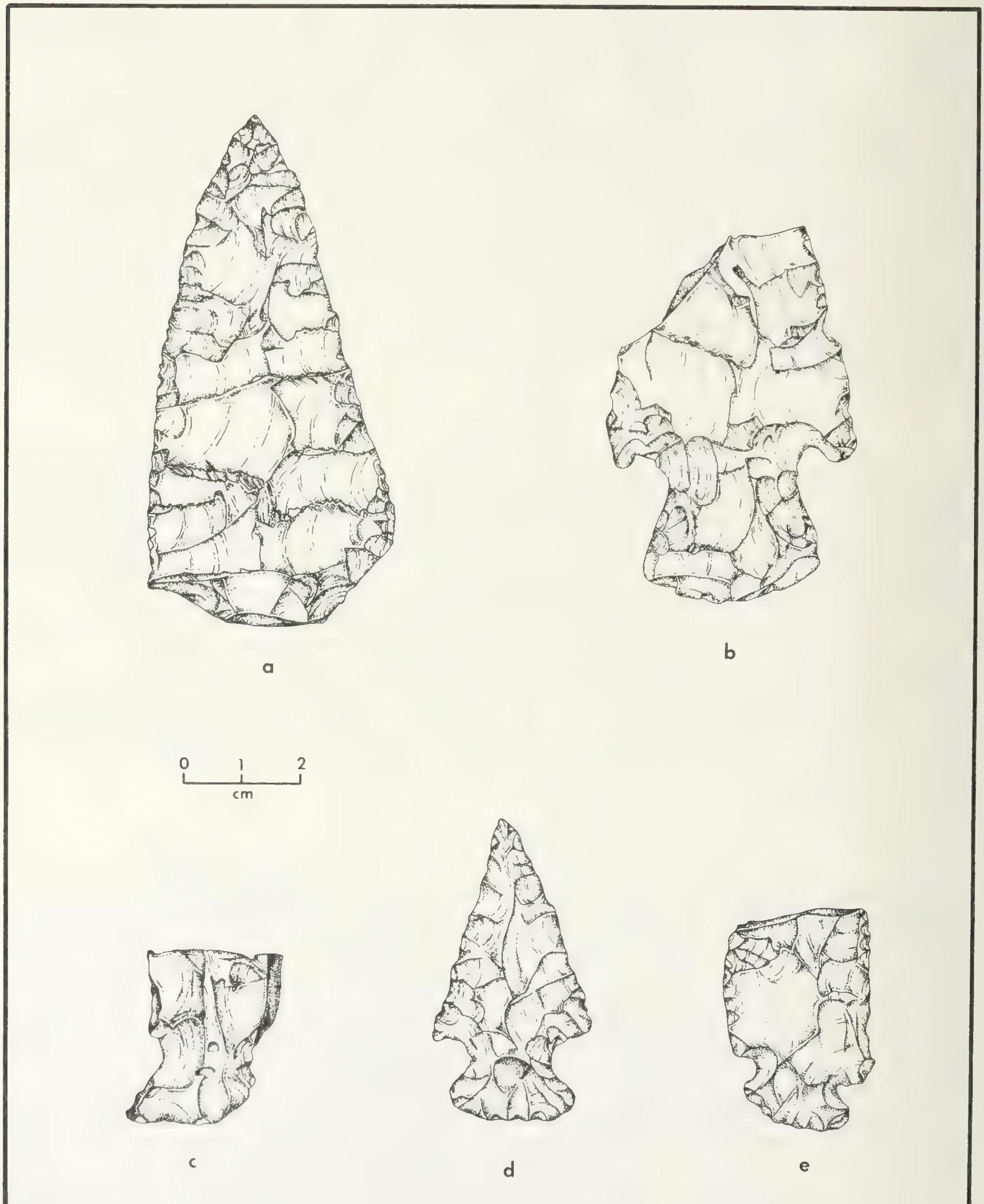


Figure 18. Large notched knives from the Taliaferro site. Provenience: Component VI, a. SCL14.2349, b. SCL14.2966, c. SCL14.2048, d. SCL14.3177, e. SCL14.4362.

Table 30. Characteristics of final biface fragments by catalog number, Taliaferro site.

Catalog Number	Excavation Area	Component	Material Type	Condition
223	B	VII	Translucent Chert	Distal
232	B	VII	Opaque Chert	Distal
322	B	VII	Translucent Chert	Distal
367	B	VII	Translucent Chert	Distal
382	B	VII	Quartzite	Distal
472	B	VII	Translucent Chert	Midsection
500	B	VII	Translucent Chert	Distal
544	B	VII	Opaque Chert	Distal
582	B	V	Translucent Chert	Distal
663	B	V	Translucent Chert	Distal
676	B	V	Translucent Chert	Distal
685	B	VII	Translucent Chert	Distal
694	B	V	Translucent Chert	Distal
713	B	V	Translucent Chert	Midsection
830	B	VII	Opaque Chert	Distal
927	B	V	Opaque Chert	Distal
940	B	V	Translucent Chert	Distal
1035	B	VII	Quartzite	Distal
1112	B	IV	Opaque Chert	Distal
1144	B	IV	Translucent Chert	Distal
1178	B	VII	Translucent Chert	Distal
1186	B	V	Translucent Chert	Distal
1261	B	V	Opaque Chert	Distal
1303	B	V	Translucent Chert	Distal
2016	A S½	VI	Opaque Chert	Distal
2029	A S½	VI	Translucent Chert	Distal
2095	A S½	VI	Opaque Chert	Distal
2177	A S½	VI	Translucent Chert	Distal
2194	A S½	VI	Translucent Chert	Distal
2314	A S½	VI	Translucent Chert	Distal
2458	A S½	VI	Translucent Chert	Distal
2494	A S½	VI	Translucent Chert	Distal
2506	A S½	VI	Translucent Chert	Midsection
2516	A S½	VI	Opaque Chert	Midsection
2718	A S½	VI	Translucent Chert	Distal
2808	A S½	III	Translucent Chert	Distal
2925	A S½	VI	Opaque Chert	Distal
2930	A S½	VI	Translucent Chert	Distal
2931	A S½	VI	Translucent Chert	Distal
3127	A S½	III	Translucent Chert	Distal
3135	A S½	III	Translucent Chert	Distal
3153	A S½	III	Opaque Chert	Distal
4090	A N½	VI	Translucent Chert	Distal
4304	A N½	III	Opaque Chert	Distal
4483	A N½	III	Quartzite	Midsection
4633	A N½	I	Quartzite	Distal
4758	A N½	I	Opaque Chert	Distal

Note: All catalog numbers have the prefix SCL14.

exclusion of the other implies relationships of some sort in a particular direction when none may exist. To avoid this confusion, the projectile points recovered from the Taliaferro site are identified by discriptive terms and are used primarily for temporal purposes. The following discussion, in addition to providing descriptions of each type, will detail the names and chronological placement of morphologically similar points in the adjacent regions. Comparisons to similar morphological types in surrounding areas is done to assess the correctness of temporal component assignment of projectile points and provide a general comparison of cultural relationships.

Table 31. Crosstabulation of final biface fragments by component and material type, Taliaferro site.

Component		Material Type			
		Translucent Chert	Opaque Chert	Quartzite	Total
I	#	0	1	1	2
	Row %	0	50.0	50.0	4.3
	Column %	0	7.7	25.0	
	Total %	0	2.1	2.1	
III	#	4	2	1	7
	Row %	57.1	28.6	1.43	14.9
	Column %	13.3	15.4	25.0	
	Total %	8.5	4.3	2.1	
IV	#	1	1	0	2
	Row %	50.0	50.0	0	4.3
	Column %	3.3	7.7	0	
	Total %	2.1	2.1	0	
V	#	8	2	0	10
	Row %	80.0	20.0	0	21.3
	Column %	26.7	15.4	0	
	Total %	17.0	4.3	0	
VI	#	10	4	0	14
	Row %	71.4	28.6	0	29.8
	Column %	33.3	30.8	0	
	Total %	21.3	8.5	0	
VII	#	7	3	2	12
	Row %	58.3	25.0	16.7	25.5
	Column %	23.3	23.1	50.0	
	Total %	14.9	6.4	4.3	
Total	#	30	13	4	47
	%	63.8	27.7	8.5	100.0

Large Points

The 39 large dart points were separated into side-notched, lanceolate, bifurcate-stemmed, and corner-notched varieties based on the location and the shape of the notches (cf. Holmer 1986). These varieties were further divided into types. Table 34 details the characteristics of the large projectile points by type and catalog number.

Side-notched

Fifteen large, side-notched projectile points were recovered during the excavations. Upon visual examination, these points were divided into three types. The major differences between these three types occur in the location and shape of the notches, the maximum blade width, and the base width. Large, side-notched points are present in all three Archaic components at the site; however, Type I occurs only in Component I and Type III is primarily found in Component III (Table 35).

Table 32. Characteristics of indeterminate bifaces by catalog number, Taliaferro site.

Catalog Number	Excavation Area	Component	Material Type
272	B	VII	Opaque Chert
306	B	VII	Translucent Chert
313	B	VII	Opaque Chert
332	B	VII	Translucent Chert
381	B	VII	Translucent Chert
416	B	V	Opaque Chert
435	B	VII	Translucent Chert
442	B	VII	Translucent Chert
449	B	VII	Opaque Chert
463	B	VII	Opaque Chert
478	B	VII	Opaque Chert
495	B	VII	Quartzite
536	B	VII	Whiskey Buttes Chert
537	B	VII	Translucent Chert
538	B	VII	Opaque Chert
539	B	VII	Translucent Chert
543	B	VII	Opaque Chert
560	B	VII	Opaque Chert
572	B	VII	Translucent Chert
580	B	VII	Translucent Chert
585	B	V	Translucent Chert
614	B	VII	Quartzite
621	B	IV	Translucent Chert
698	B	V	Translucent Chert
846	B	VII	Translucent Chert
849	B	VII	Translucent Chert
882	B	VII	Obsidian
883	B	VII	Translucent Chert
890	B	VII	Opaque Chert
896	B	VII	Whiskey Buttes Chert
900	B	VII	Opaque Chert
918	B	V	Opaque Chert
937	B	V	Translucent Chert
988	B	V	Translucent Chert
1004	B	V	Translucent Chert
1027	B	VII	Quartzite
1034	B	VII	Translucent Chert
1165	B	VII	Opaque Chert
1215	B	VII	Translucent Chert
1288	B	VII	Translucent Chert
1295	B	IV	Translucent Chert
1336	B	V	Opaque Chert
1370	B	IV	Quartzite
938	B	V	Translucent Chert
2158	A S½	VI	Translucent Chert
2347	A S½	VI	Opaque Chert
2471	A S½	VI	Translucent Chert
2501	A S½	VI	Translucent Chert
2692	A S½	VI	Opaque Chert
2736	A S½	VI	Translucent Chert
2893	A S½	VI	Translucent Chert
2964	A S½	VI	Opaque Chert
3126	A S½	VI	Opaque Chert
3225	A S½	VI	Opaque Chert
4009	A N½	II	Opaque Chert
4012	A N½	III	Opaque Chert
4017	A N½	VI	Translucent Chert
4113	A N½	III	Translucent Chert
4174	A N½	II	Translucent Chert
4204	A N½	II	Opaque Chert
4262	A N½	III	Translucent Chert
4272	A N½	VI	Translucent Chert
4293	A N½	III	Quartzite
4294	A N½	III	Translucent Chert
4324	A N½	VI	Translucent Chert
4349	A N½	VI	Translucent Chert
4381	A N½	III	Translucent Chert
4391	A N½	III	Quartzite
4411	A N½	III	Translucent Chert
4500	A N½	II	Translucent Chert
4528	A N½	III	Translucent Chert
4572	A N½	I	Translucent Chert
4884	A N½	I	Translucent Chert
4890	A N½	I	Opaque Chert
4995	A N½	I	Quartzite

Table 32. Concluded.

Catalog Number	Exca-vation Area	Component	Material Type
1167	B	VII	Translucent Chert
1210	B	VII	Translucent Chert
1213	B	VII	Translucent Chert
1214	B	VII	Translucent Chert
5013	A N½	I	Quartzite
5042	A N½	I	Translucent Chert
5076	A N½	II	Whiskey Buttes Chert
5098	A N½	II	Translucent Chert
5194	A N½	II	Translucent Chert

Note: All catalog numbers have the prefix SCL14.

Type I: Seven large, side-notched points were included in the Type I category, and all are from Component I (Table 35; Figure 19 a-e). Four are of quartzite, two are of obsidian, and one is of translucent algalitic chert. These points have triangular blade forms with slightly convex lateral edges, notches that are perpendicular to the edges, and bases that are about as wide as the blade. Most have concave bases. Of the three side-notched types, these are the widest, and the notches are set the highest on the sides. Table 36 provides the mean, standard deviation, and variance of the measurements for these points.

Type I points resemble points that are often referred to as Northern Side-notched in the literature. This type was first named for specimens found in Occupation Level IV at Wilson Butte Cave in southcentral Idaho with an estimated date of 6500 years ago (Gruhn 1961). According to Holmer's (1978) discriminant analysis of Archaic dart points, the Northern Side-notched points are statistically identical to the Bitterroot Side-notched type as defined by Swanson et al. (1964) from other sites in Idaho. In the eastern Great Basin, similar points were recovered from Hogup Cave in strata dating between 7000 and 5000 years ago (Aikens 1970) and from Danger Cave (Jennings 1957). Sudden Shelter, in the Northern Colorado Plateau, also yielded Northern Side-notched points with an age of 6500 to 6000 years B.P. (Jennings et al. 1980).

Similar large, side-notched points, termed Mummy Cave Side-notched, typify Cultural Layers 19-24 at Mummy Cave in northwestern Wyoming, which date between 7600 and 5600 years ago (McCracken et al. 1978). Other sites in the Northwestern Plains that contain early side-notched projectile points include the Sorenson site in the Big Horn Canyon (Husted 1969) and the Pretty Creek site in southcentral Montana (Loendorf et al. 1981). This point type also is present at sites of similar age in the Northern Plains, such as Head-Smashed-In located in southwestern Alberta where it is part of the assemblage of the Mummy Cave Complex (Reeves 1978). Among the sites in southwest Wyoming, Component II at the Maxon Ranch site, dating to about 4800 years ago, produced two similar side-notched points (Harrell and McKern 1986). Overall, these points have a fairly wide distribution throughout the northern United States and roughly date between 7000 and 5000 years ago, which corresponds to their age at the Taliaferro site.

Table 33. Crosstabulation of indeterminate bifaces by component and material type, Taliaferro site.

Component		Material Type					
		Translucent Chert	Opaque Chert	Quartzite	Whiskey Buttes Chert	Obsidian	Total
I	#	3	1	2	0	0	6
	Row %	50.0	16.7	33.3	0	0	7.1
	Column %	6.1	4.3	25.0	0	0	
	Total %	3.6	1.2	2.4	0	0	
II	#	4	2	0	1	0	7
	Row %	57.1	28.6	0	14.3	0	8.3
	Column %	8.2	8.7	0	33.3	0	
	Total %	4.8	2.4	0	1.2	0	
III	#	6	2	2	0	0	10
	Row %	60.0	20.0	20.0	0	0	11.9
	Column %	12.2	8.7	25.0	0	0	
	Total %	7.1	3.6	0	0	0	
IV	#	2	0	1	0	0	3
	Row %	66.7	0	33.3	0	0	3.6
	Column %	4.1	0	12.5	0	0	
	Total %	2.4	0	1.2	0	0	
V	#	6	3	0	0	0	9
	Row %	66.7	33.3	0	0	0	10.7
	Column %	12.2	13.0	0	0	0	
	Total %	7.1	3.6	0	0	0	
VI	#	9	4	0	0	0	13
	Row %	12.2	13.0	0	0	0	15.5
	Column %	18.4	17.4	0	0	0	
	Total %	10.7	4.8	0	0	0	
VII	#	19	11	3	2	1	36
	Row %	52.8	30.6	8.3	5.6	2.8	42.9
	Column %	38.8	47.8	37.5	66.7	100.0	
	Total %	22.6	13.1	3.6	2.4	1.2	
Total	#	49	23	8	3	1	84
	%	58.3	27.4	9.5	3.6	1.2	100.0

Type II: Five specimens were classified as Type II large, side-notched projectile points (Figure 19 f-i). At the Taliaferro site these have a long temporal span: two are from Component I, one each is from Components II and III, and one is from the surface (Table 35). Material types include three of quartzite and two of translucent algalitic chert. These points have triangular blade forms with slightly convex or straight lateral edges and straight to slightly convex bases. The distal portion of the notch is perpendicular to the lateral edge, and the proximal side slopes toward the base. Except for one specimen (SCL14.4964), which is almost corner notched, most have bases that are about as wide as the blades. They are narrower than the Type I points, and the notches are lower on the sides and form a shorter stem. Table 37 shows the mean, standard deviation, and variance of the measurements of these points.

Table 34. Characteristics of large projectile points by catalog number and type, Taliaferro site.

Catalog Number	Excavation Area	Component	Material Type	Condition	Length (mm)	Width (mm)	Thickness (mm)	Base Width (mm)	Neck Width (mm)	Stem Length (mm)
				Large, Side-Notched Type I						
4416	A N½	I	Quartzite	Proximal/medial	-	17.5	4.0	-	13.9	8.7
4646	A N½	I	Quartzite	Complete	37.5	20.1	4.3	-	15.3	8.0
4760	A N½	I	Quartzite	Complete	41.9	21.1	4.2	22.8	13.5	10.2
4897	A N½	I	Obsidian	Proximal	-	-	3.7	18.8	13.2	-
4913	A N½	I	Quartzite	Proximal/medial	-	22.6	5.4	-	-	-
5077	A N½	I	Obsidian	Proximal/medial	-	18.2	4.6	19.7	16.1	9.1
5079	A N½	I	Translucent Chert	Proximal/medial	-	17.9	3.3	17.5	12.5	-
				Large, Side-Notched Type II						
2729	A S½	III	Quartzite	Complete	43.1	15.1	4.3	15.4	11.1	7.6
4035	A N½	II	Translucent Chert	Proximal/medial	-	-	3.7	16.4	11.6	7.1
4041	A N½	Surface	Quartzite	Proximal/medial	-	-	4.3	15.3	11.7	6.7
4861	A N½	I	Quartzite	Complete	38.3	15.2	4.6	16.0	10.6	7.0
4964	A N½	I	Translucent Chert	Complete	27.6	20.6	5.1	15.6	12.7	11.2
				Large, Side-Notched Type III						
2932	A S½	VI	Translucent Chert	Complete	19.5	16.8	4.0	17.9	12.3	7.1
3156	A S½	III	Opaque Chert	Proximal	-	19.1	4.0	16.7	13.8	6.8
3176	A S½	III	Translucent Chert	Proximal/medial	-	16.3	3.7	17.2	14.3	7.6
				Large, Lanceolate Type I						
1246	B	VII	Translucent Chert	Complete	31.4	15.3	4.6	13.8	-	-
2132	A S½	VI	Translucent Chert	Proximal/medial	-	14.6	4.1	15.5	-	-
4167	A N½	II	Translucent Chert	Complete	30.3	15.4	3.7	13.0	-	-
4560	A N½	II	Translucent Chert	Complete	34.5	14.6	4.0	14.9	-	-
				Large, Lanceolate Type II						
2110	A S½	III	Opaque Chert	Proximal/medial	-	14.6	4.5	12.8	-	-
3214	A S½	III	Opaque Chert	Proximal/medial	-	17.0	6.8	12.6	-	-
4482	A N½	III	Opaque Chert	Proximal/medial	-	15.9	5.5	11.6	-	-
4670	A N½	II	Translucent Chert	Proximal/medial	-	18.7	4.1	13.6	-	-

Table 34. Concluded.

Catalog Number	Excavation Area	Component	Material Type	Condition	Length (mm)	Width (mm)	Thickness (mm)	Base Width (mm)	Neck Width (mm)	Stem Length (mm)
				Large, Bifurcate-Stemmed Type I						
915	B	VII	Quartzite	Proximal/medial	-	26.6	6.1	15.6	13.1	11.4
1052	B	V	Translucent Chert	Proximal/medial	-	19.1	5.0	14.6	10.7	9.9
4133	A N½	II	Quartzite	Proximal/medial	-	-	4.6	14.0	12.1	12.8
				Large, Bifurcate-Stemmed Type II						
2517	A S½	III	Opaque Chert	Proximal/medial	-	-	4.0	12.1	9.4	9.0
3137	A S½	III	Translucent Chert	Complete	25.1	17.0	4.4	13.8	11.9	9.1
				Large, Corner-Notched						
1205	B	VII	Opaque Chert	Proximal/medial	-	19.6	4.5	-	11.2	7.8
2783	A S½	III	Opaque Chert	Proximal/medial	-	19.6	4.9	17.1	12.5	9.1
2839	A S½	III	Quartzite	Proximal/medial	-	-	5.1	14.5	11.6	9.6
3154	A S½	III	Moss Agate	Complete	31.2	19.7	4.3	9.6	9.1	6.0
3090	A S½	III	Translucent Chert	Proximal/medial	-	21.0	4.5	-	11.6	7.3
3067	A S½	III	Translucent Chert	Complete	37.9	22.8	3.1	12.7	11.9	6.1
				Miscellaneous Fragments						
2511	A S½	VI	Opaque Chert	Fragment	-	-	-	-	-	-
2540	A S½	VI	Obsidian	Fragment	-	-	-	-	-	-
2775	A S½	III	Quartzite	Fragment	-	-	-	-	-	-
3066	A S½	III	Translucent Chert	Fragment						
4334	A N½	II	Quartzite	Fragment	-	-	-	-	-	-

Note: All catalog numbers have the prefix SCL14.

Table 35. Crosstabulation of large projectile point types by component, Taliaferro site.

Component		Side-Notched Type I	Side-Notched Type II	Side-Notched Type III	Lanceolate Type I	Lanceolate Type II	Bifurcate-Stemmed Type I	Bifurcate-Stemmed Type II	Corner-Notched	Miscellaneous Fragments	Total
		Large Projectile Point Type									
Surface	#	0	1	0	0	0	0	0	0	0	1
	Row %	0	100.0	0	0	0	0	0	0	0	2.6
	Column %	0	20.0	0	0	0	0	0	0	0	
	Total %	0	2.6	0	0	0	0	0	0	0	
I	#	7	2	0	0	0	0	0	0	0	9
	Row %	77.8	22.2	0	0	0	0	0	0	0	23.1
	Column %	100.0	40.0	0	0	0	0	0	0	0	
	Total %	17.9	5.1	0	0	0	0	0	0	0	
II	#	0	1	0	2	1	1	0	0	1	6
	Row %	0	16.7	0	33.3	16.7	16.7	0	0	16.7	15.4
	Column %	0	20.0	0	50.0	25.0	33.3	0	0	20.0	
	Total %	0	2.6	0	5.1	2.6	2.6	0	0	2.6	
III	#	0	1	2	0	3	0	2	5	2	15
	Row %	0	6.7	13.3	0	20.0	0	13.3	33.3	13.3	38.5
	Column %	0	20.0	66.7	0	75.0	0	100.0	83.3	40.0	
	Total %	0	2.6	5.1	0	7.7	0	5.1	12.8	5.1	
V-VII	#	0	0	1	2	0	2	0	1	2	8
	Row %	0	0	12.5	25.0	0	25.0	0	12.5	25.0	20.5
	Column %	0	0	33.3	50.0	0	66.0	0	16.7	40.0	
	Total %	0	0	2.6	5.1	0	5.1	0	2.6	5.1	
Total	#	7	5	3	4	4	3	2	6	5	39
	%	17.9	12.8	7.7	10.3	10.3	7.7	5.1	15.4	12.8	100.0

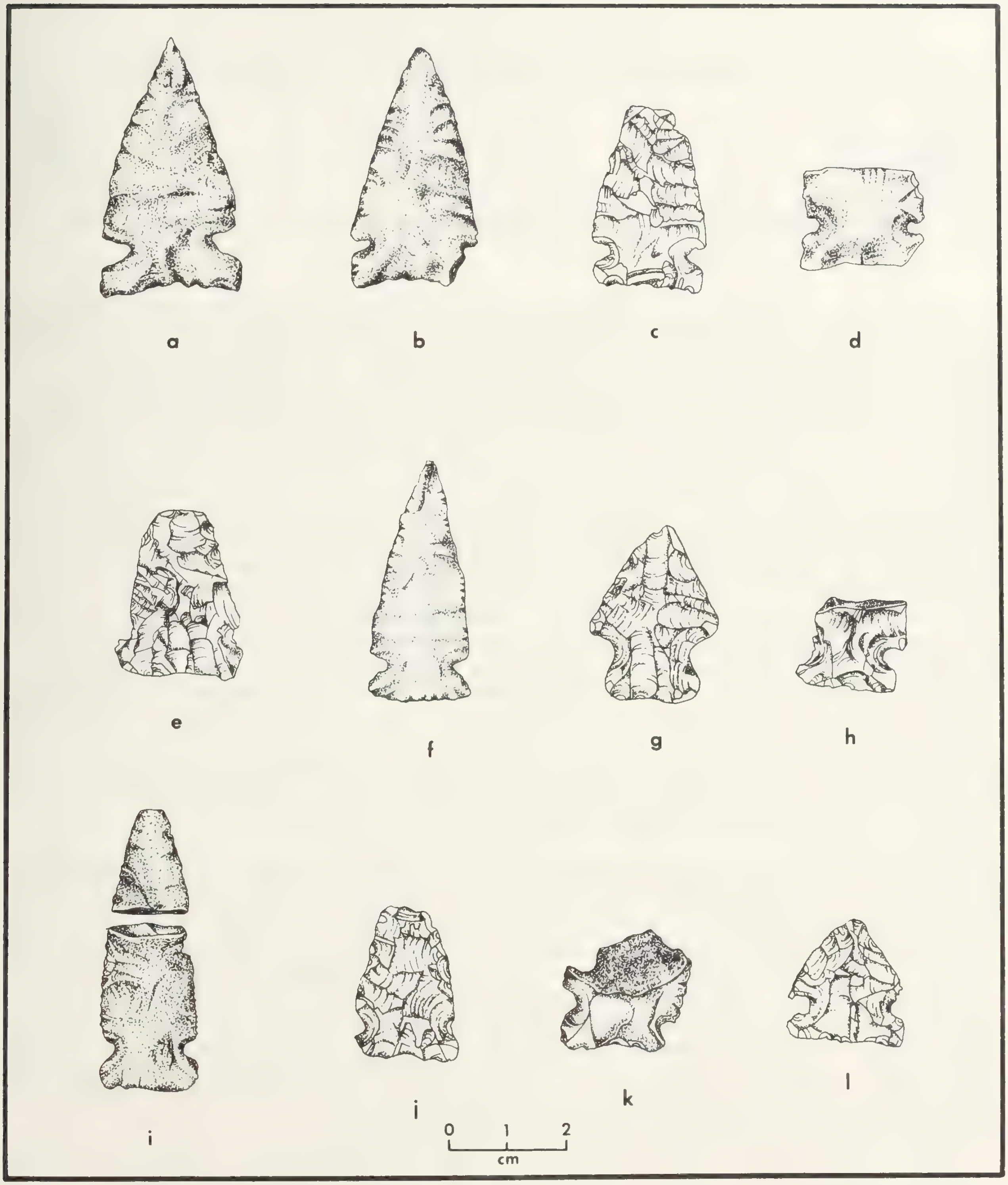


Figure 19. Large, side-notched projectile points from the Taliaferro site. a-e, Type I; f-i, Type II; j-i, Type III. Provenience: Component I, a. SCL14.4760, b. SCL13.4646, c. SCL14.5079, d. SCL14.4416, e. SCL14.5077, f. SCL14.4861, g. SCL14.4964; Component III, i. SCL14.2729, j. SCL14.3176, k. SCL14.3156; Component VI, l. SCL14.2932.

Table 36. The mean, standard deviation, and variance of Type I large, side-notched projectile point measurements, Taliaferro site.

	Number	Mean	Standard Deviation	Variance
Length	2	39.7	3.1	9.6
Width	6	19.5	2.0	4.1
Thickness	7	4.2	0.6	0.4
Base Width	4	19.2	2.2	5.0
Neck Width	6	14.0	1.3	1.8
Stem Length	4	9.0	0.9	0.8

The Type II point is similar to those referred to as Elko Side-notched points in the archeological literature of the Great Basin. They were first named from specimens found at South Fork Shelter in Nevada (Heizer et al. 1968). Holmer (1986) statistically demonstrated that the Elko Side-notched points form a continuum with the corner-notched variety and should be considered as a single type. In the eastern Great Basin and northern Colorado Plateau, they are the most plentiful and least temporally diagnostic of the point types. Elko Side-notched points were found in strata dating between 6000 and 3200 years ago at Hogup Cave (Aikens 1970) and occur in levels DII-DV at Danger Cave (Jennings 1957). They appear to have a more limited temporal distribution, ranging about 3300 to 1300 years ago, in the western Great Basin (Holmer 1986).

The long chronological span of these points at the Taliaferro site is consistent with other sites in the region; however, the temporal "hiatus" between 3400 and 1800 years B.P. noted by Holmer (1978) for the eastern Great Basin is not evident at the Taliaferro site, or at others in southwest Wyoming. At one of these sites, the large, stratified Deadman Wash site, Elko Side-notched points were recovered from layers dating between 6800 and 2000 years ago (Creasman 1984). Similar points occur in each of the three Archaic components at the Sweetwater Creek site (dating 5130, 4380, and 3710 B.P.), another site in southwest Wyoming (Newberry and Harrison 1986).

Type III: The remaining three side-notched specimens were included in the Type III category (Figure 19 j-i); two are from the Late Archaic Component III and one is from the Late Prehistoric Component VI (Table 34). Material types include two of translucent algalitic chert and one of opaque algalitic chert. These points have fairly wide, shallow, U-shaped notches that occur low on the blade. The bases are slightly concave and are as wide, or wider, than the blade. Overall they are about as wide as the Type I side-notched points, but they have shallower notches as evidenced by comparisons between their neck widths. Table 38 details the mean, standard deviation, and variance of the point measurements. The one specimen (SCL14.2932) from the Late Prehistoric component has been reworked.

Type III side-notched points resemble those called Avonlea in the literature from the Northwestern Plains. They were named for the Avonlea site in southcentral Saskatchewan (Kehoe and McCorquodale 1961). The Gull Lake bison drive site in southwestern Saskatchewan yielded 333 points of this type with dates ranging from 1800 to 1400 years ago (Kehoe 1973). According to Reeves (1983), Avonlea points are present in the Todd Subphase of the Big Horn and Shoshone Basins dating around 1500 years ago. Avonlea points from several

Table 37. The mean, standard deviation, and variance of Type II large, side-notched dart point measurements, Taliferro site.

	Number	Mean	Standard Deviation	Variance
Length	3	36.3	7.9	62.9
Width	3	16.9	3.1	9.9
Thickness	5	4.4	0.5	0.2
Base Width	5	15.7	0.4	0.2
Neck Width	5	11.5	0.7	0.6
Stem Width	5	7.9	1.8	3.4

sites on the Northwestern Plains also are associated with the earlier Pelican Lake Corner-notched. The three points from the Taliaferro site appear to occur slightly earlier in time and somewhat outside the range of the Plains Avonlea type. Because they are associated with large, corner-notched points that are similar to the Pelican Lake type, the three specimens may actually be Avonlea.

Lanceolate

Eight unnotched lanceolate points were recovered from the Taliaferro site; these were divided into two types using morphological and technological attributes. The primary morphological difference is in the shape and thickness of the base. Technologically, Type I points appear to have been manufactured in the flake tool reduction sequence, whereas Type II specimens were produced from bifaces. The two types appear to have temporal differences as Type I dominates in Component II and Type II occurs mostly in Component III (Table 35).

Type I: Four large, lanceolate projectile points were grouped into the Type I category. Two belong to Component II, and one each was found in Components VI and VII (Table 35; Figure 20 a-d); however, the two from the Late Prehistoric period are probably out of place. All are of translucent algalitic chert. These points have deep, concave bases and appear to have been manufactured from flakes. Morphologically they differ from the Type II specimens in having a more pronouced concave base and in being thinner in cross section. Table 39 provides the mean, standard deviation, and variance of the point measurements.

Points with similar shapes as the Type I lanceolate points are referred to as McKean Lanceolate in the Northwestern Plains and as Humboldt Concave Base in the Great Basin. Green (1975) has attempted to separate these types using technological characteristics, such as flaking patterns. The Type I lanceolate points from the Taliaferro site, which were made from flakes, more closely resemble the McKean Lanceolate type in shape and temporal distribution. In contrast, the Type II specimens from the Taliaferro site appear to be more like the Humboldt Concave Base.

The McKean Lanceolate type was named for specimens recovered from the lower level of the McKean site and other sites in the Keyhole Reservoir area (Mulloy 1954; Wheeler 1952). Points of this type, part of the McKean Complex assemblage, are found at sites scattered throughout the Northwestern Plains

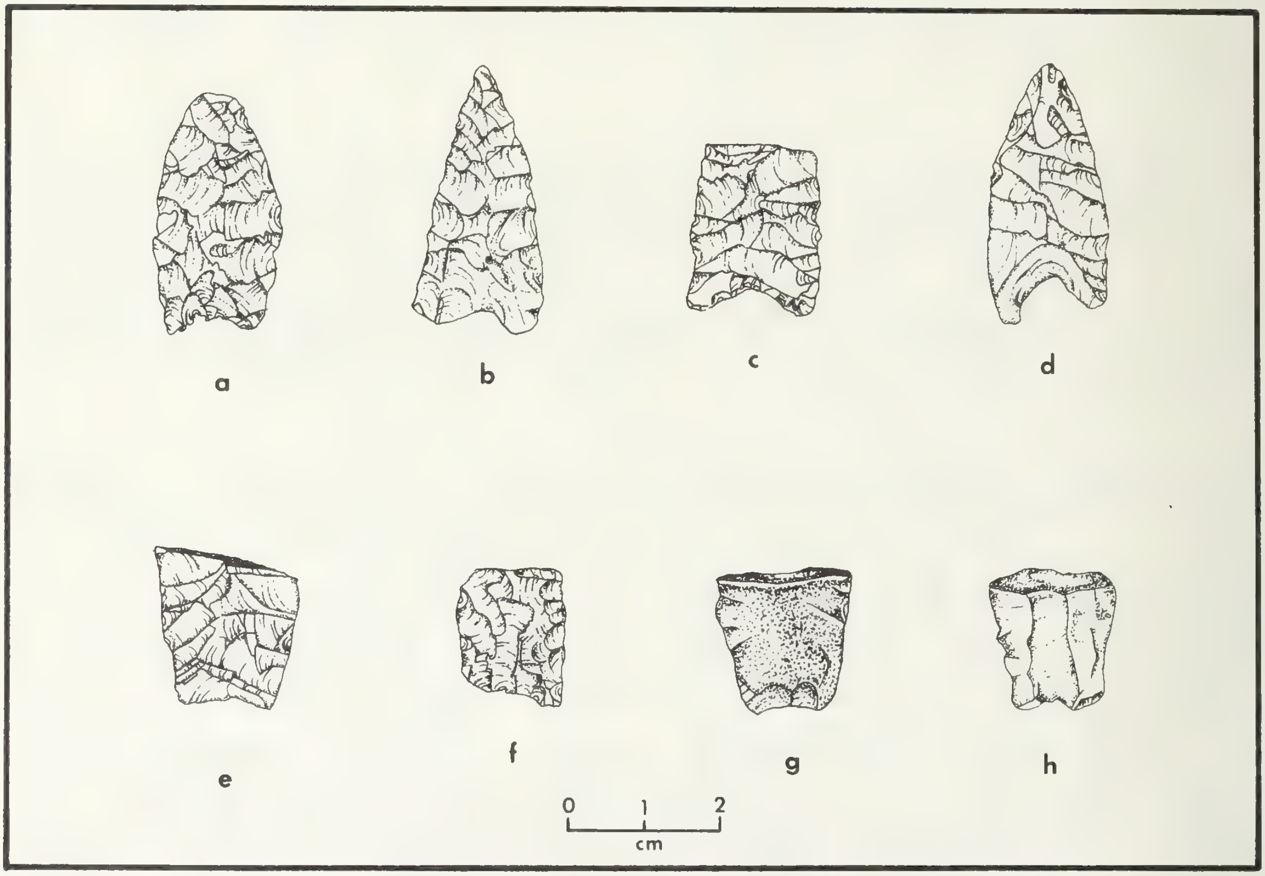


Figure 20. Large, lanceolate projectile points from the Taliaferro site. a-d, Type I; e-h, Type II. Provenience: Component II, a. SCL14.4167, b. SCL14.4560; Component VI, c. SCL14.2132; Component VII, d. SCL14.1246; Component II, e. SCL14.4670; Component III, f. SCL14.2110, g. SCL14.3214, h. SCL14.4482.

Table 38. The mean, standard deviation, and variance of Type III large, side-notched projectile point measurements, Taliferro site.

	Number	Mean	Standard Deviation	Variance
Length	1	19.5	0	0
Width	3	17.4	1.4	2.2
Thickness	3	3.9	0.1	0.03
Base Width	3	17.2	0.6	0.3
Neck Width	3	13.4	1.0	1.0
Stem Width	3	7.1	0.4	0.1

and roughly date between 5000 and 3000 years ago (Frison 1978). In the northern Colorado Plateau, Holmer (1978) identified McKean Lanceolate points from Sudden Shelter with an age ranging between 4600 and 3500 years. He separates these points from an earlier occurring lanceolate form, which he calls Humboldt Concave Base. Though McKean Lanceolate points dating to approximately the same period have been described from such sites as Danger Cave and Hogup Cave in Utah and Wilson Butte Cave in Idaho, Green (1975) feels they actually belong to the Humboldt Concave Base type. Regardless of the name, a concave base lanceolate point form occurs throughout the Great Basin with an age similar to those of the Northwestern Plains. The temporal distribution of the Type I lanceolate points from the Taliaferro site corresponds to those of the surrounding regions.

Type II: Four specimens, all basal fragments, were classified as Type II lanceolate projectile points (Figure 20 e-h). Three are from Component III, and one is from Component II (Table 40). Raw material types include three of opaque and one of translucent algalitic chert. These points have shallow concave bases and are thicker in cross section than the Type I specimens. They appear to have been manufactured from bifaces instead of flakes.

These Type II points resemble the Humboldt Concave Base described in the literature of the Great Basin. They were first defined by Heizer and Clewlow (1968) from specimens found at the Humboldt Lakebed site in Nevada. Humboldt Concave Base points have a long temporal range in the Great Basin. They date between 7300 to 1300 years ago at Hogup Cave (Aikens 1970) and range from 6000 to 3100 years ago at sites in the western Great Basin (Heizer and Hester 1978). At Gatecliff Shelter in central Nevada, Thomas (1983) found this point type in deposits dating between 4300 and 1300 years B.P.; he considers the earlier concave lanceolate points dating before 5000 years ago at the site as a separate type. Green (1975) places the upper time boundary of the Humboldt Concave points at 2200 years ago. The Type II points recovered from the Middle and Late Archaic components at the Taliaferro site fit into the later portion of this wide time range. They appear to be slightly later in time than the Type I lanceolate points.

Bifurcate-stemmed

Five bifurcate-stemmed points were recovered during the excavations; these were divided into two types using base characteristics. Type I specimens have a deep U- or V-shaped basal notch whereas Type II points have only a slight concave base. The three Type I points are distributed among

Table 39. The mean, standard deviation, and variance of Type I large, lanceolate projectile point measurements, Taliaferro site.

	Number	Mean	Standard Deviation	Variance
Length	3	32.0	2.1	4.7
Width	4	14.9	0.4	0.1
Thickness	4	4.1	0.3	0.1
Base Width	4	14.3	1.1	1.2

Components II, V, and VII (Table 34); the two from the Late Prehistoric period were probably displaced due to erosion of the Component II deposits. The Type II points are from Component III (Table 34).

Type I: Three large, bifurcate-stemmed points were classified as Type I (Figure 21 a-c). Though one each was found in Components II, V, and VII, all probably originated from the Middle Archaic Component II (Table 34). Two are of quartzite, and one is of translucent algalitic chert. These points have notches that form barbed to sloping shoulders and a slightly expanding stem. The stem is narrower than the blade width and contains a deep basal notch. Table 41 shows the mean, standard deviation, and variance of the measurements of these points.

Morphologically similar points are referred to as Pinto or Gatecliff Split Stem in the Great Basin literature and as Duncan in the Northwestern Plains. Pinto points originally were defined from specimens recovered from the western Great Basin (Amsden 1935; Harrington 1957). The dates for this point type fall into two groups; one is from 8300 to 6200 years B.P., and the other is between 5000 and 3300 years ago (Holmer 1986). The early group of dates is from sites in the eastern Great Basin and the northern Colorado Plateau, such as Hogup Cave, Danger Cave, and Sudden Shelter (Aikens 1970; Jennings 1957; Jennings et al. 1980). The later dates are from sites in the western Great Basin (Heizer and Hester 1978).

Leach (1970) noticed a temporal, as well as a morphological, difference in the bifurcate-stemmed projectile points from Deluge Shelter in Dinosaur National Monument. The points from Occupation Layer 14 dating between 6000 and 5000 years ago were referred to as Pinto, and the later ones from Level 12 with an age of approximately 4000 years B.P. were typed as Duncan. From points recovered in deposits dating to about 3500 to 3000 years B.P. at Gatecliff Shelter in central Nevada, Thomas (1981) has proposed the name Gatecliff Split Stem for the more recent group and has retained the term Pinto for the older series. Holmer (1986) has demonstrated statistically, using a discriminant analysis, a significant morphological difference between the early Pinto points and the later Gatecliff Split Stem ones.

For the Northwestern Plains, Duncan points were first named by Wheeler (1954) using specimens from sites in the Keyhole Reservoir area of eastern Wyoming and the Angostura Reservoir area of southwestern South Dakota. This point type was found in the lower level at the McKean site associated with the McKean Lanceolate variety (Mulloy 1954) and has been considered as part of the McKean Complex assemblage dating between 5000 and 3000 years ago. However, each of the various McKean Complex point styles, including McKean Lanceolate,

Table 40. The mean, standard deviation, and variance of Type II large, lanceolate projectile point measurements, Taliaferro site.

	Number	Mean	Standard Deviation	Variance
Length	0	-	-	-
Width	4	16.5	1.7	3.0
Thickness	4	5.2	1.2	1.4
Base Width	4	12.6	0.8	0.6

Duncan, and Hanna, are at times found separately in different components or at different sites, possibly suggesting slight temporal differences (Frison 1978; Keyser and Davis 1985). Recent reinvestigations at the McKean site have shown that Mulloy's lower level is actually a well developed soil horizon representing 2000 years of slow accumulation (Kornfeld and Frison 1985). Unfortunately, the small number of artifacts recovered during these excavations precluded sorting out temporal changes in the point types.

Belonging to the Middle Archaic Component II at the Taliaferro site, the Type I bifurcate-stemmed points correspond in age to the Duncan as well as the later group of the Pinto series and Gatecliff Split Stem. Similar points were recovered from Cultural Layer 30 with a date of 4420 years B.P. at Mummy Cave in northwest Wyoming (McCracken et al. 1978). In southwest Wyoming, they occur in numerous surface collections and are present in mixed assemblages at stratified sites, such as Pine Springs (Sharrock 1966) and Deadman Wash (Armitage et al. 1982). Bifurcate-stemmed points appear to have been quite common over a wide geographical area of the western United States between 5000 and 3000 years ago.

Type II: Two large, bifurcate-stemmed projectile points were included in this category (Figure 21 d-e). They were recovered from the Late Archaic Component III. One is of opaque algalitic chert and one is of translucent algalitic chert (Table 34). These points have notches that form square shoulders and a slightly expanding stem. The stem is narrower than the blade width, and in contrast to Type I specimens, they have only shallow concave bases. The complete point (SCL14.3137) appears to have been reworked. Table 42 shows the mean, standard deviation, and variance of the measurements of these points.

Morphologically these points resemble the Hanna type of the Northwestern Plains first defined by Wheeler (1954). They may also belong in the Pinto series of the Great Basin (Harrington 1957). Hanna points, along with the McKean Lanceolate and Duncan types, are part of the McKean Complex assemblage of the Middle Plains Archaic period (Frison 1978). The Type II bifurcate-stemmed points from the Taliaferro site, however, are associated with the Late Archaic Component III containing large, corner-notched points and dating between 2800 and 1900 years ago. As at the Taliaferro site, the upper level of the McKean site contains Hanna points in association with the Pelican Lake Corner-notched (Mulloy 1954). These points also occur together on the Northern Plains at sites such as Head-Smashed-In Buffalo Jump dating between 3000 and 2700 years ago (Reeves 1978). These associations indicate that Hanna points may be slightly later in time than the other McKean Complex types and may extend into the Late Plains Archaic period. Occupation Area B at 48UT199

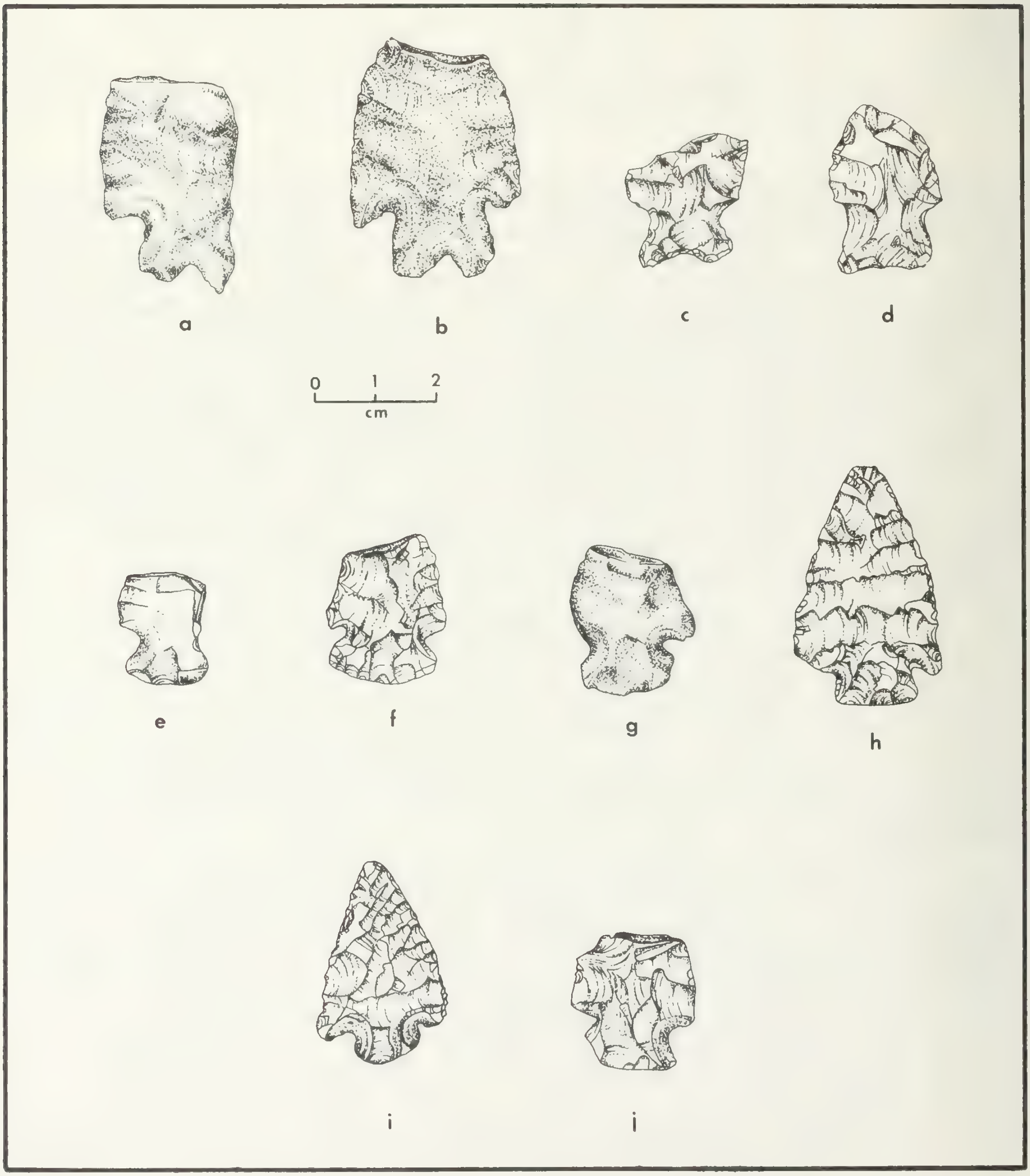


Figure 21. Large, bifurcate-stemmed and corner-notched projectile points from the Taliaferro site. a-c, Type I bifurcate-stemmed; d-e, Type II bifurcate-stemmed; f-j, corner-notched. Provenience: Component II, a. SCL14.4133; Component VII, b. SCL14.915; Component V, c. SCL14.1052; Component III, d. SCL14.3137, e. SCL14.2517, f. SCL14.2783, g. SCL14.2839, h. SCL14.3067, i. SCL14.3154; Component VII, j. SCL14.1205.

Table 41. The mean, standard deviation, and variance of Type I large, bifurcate-stemmed projectile point measurements, Taliaferro site.

	Number	Mean	Standard Deviation	Variance
Length	0	-	-	-
Width	2	22.8	5.3	28.1
Thickness	3	5.2	0.7	0.6
Base Width	3	14.7	0.8	0.6
Neck Width	3	11.9	1.2	1.4
Stem Length	3	11.3	1.4	2.1

in southwest Wyoming also produced Hanna points in association with the Pelican Lake corner-notched type, though the radiocarbon age of 4900 years ago is much earlier than these points normally date (Schroedl 1985). The deposits at 48UT199 may be considerably mixed, as evidenced by McKean Lanceolate and corner-notched points occurring with a feature in Occupation Area A dating to 1400 years ago.

Corner-notched

Six large, corner-notched points were found at the Taliaferro site, which were included as one type though there is much variation in their shape (Figure 21 f-j). Except for one, which is probably out of context, all are from the Late Archaic Component III (Table 34). Material types include two each of translucent and opaque algalitic chert and one each of quartzite and moss agate. These points have triangular blade forms with straight to slightly convex edges and corner notches that form barbed shoulders. They have straight to convex bases that are narrower than the maximum blade width. Table 43 details the mean, standard deviation, and variance of the measurements for these points.

Large, corner-notched points usually are assigned to the Pelican Lake type in the Northwestern Plains and to the Elko series in the Great Basin. The Pelican Lake type was first defined at the Mortlach site in central Saskatchewan by Wettlaufer (1955). They are diagonstic of the Pelican Lake phase of the Late Middle Prehistoric period occuring throughout the Northern and Northwestern Plains (Reeves 1983). Among the sites in Wyoming where similar corner-notched points occur in deposits dating between 2800 and 2000 years ago is Mummy Cave (McCracken et al. 1978), and they have an age of 1725 years B.P. at Spring Creek Cave (Frison 1965).

The Elko Corner-notched points of the Great Basin were first named for specimens found at Wagon Jack Shelter in Nevada (Heizer and Baumhoff 1961). As with the side-notched variety, they have a long time range in the eastern Great Basin. At Hogup Cave they date between 6000 and 1200 years ago (Aikens 1970) and occur in levels DII-DV at Danger Cave (Jennings 1957). In the western Great Basin, they have a more limited temporal distribution dating from 3300 to 1300 years B.P. at sites such as Gatecliff Shelter (Thomas 1983). Those in the western Great Basin date to the period during which Holmer (1986) notes a hiatus in their occurrence for the eastern Great Basin.

The large, corner-notched points from the Taliaferro site date between 2800 and 1900 years ago, which corresponds to the chronological placement of

Table 42. The mean, standard deviation, and variance of Type II large, bifurcate-stemmed projectile point measurements, Taliaferro site.

	Number	Mean	Standard Deviation	Variance
Length	1	25.1	0	0
Width	1	17.0	0	0
Thickness	2	4.2	0.2	0.08
Base Width	2	12.9	1.2	1.4
Neck Width	2	10.6	1.7	3.1
Stem Length	2	9.0	0.07	0.00

the Pelican Lake type on the Northwestern Plains as well as in part to the Elko series in the western Great Basin. Though they appear to be mostly limited to the Late Plains Archaic period throughout Wyoming (Frison 1978), large, corner-notched points occur in most cultural components ranging from 6800 to 400 years ago at the Deadman Wash site in southwest Wyoming (Creasman 1984). Overall, large, corner-notched points, like many of the other projectile point shapes, have a wide geographical distribution throughout western North America.

Miscellaneous Fragments

The remaining five specimens were too fragmentary for classification into one of the above mentioned types and are included as miscellaneous fragments. Two each belong to Components III and VI, and one is associated with Component II (Table 34). Material types include two of quartzite, one each of opaque and translucent algalitic chert, and one of obsidian.

Small Points

The 79 small arrow points were separated into corner-notched and side-notched varieties using location and shape of notches. Table 44 details the characteristics of the small projectile points by type and catalog number. The presence of small points in the archaeological record is generally thought to represent the use of the bow and arrow (Holmer 1986). The earliest occurrence of these points at archaeological sites in southwest Wyoming is about 1550 years ago (Hoefer 1986).

Corner-notched

Though much variation is evident in the shape of the notches, stem, and shoulders of these small points, 72 were classified as corner-notched (Figure 22 a-x; Figure 23 a-t). Two are from the Late Archaic Component III, 10 are from Component IV, 15 are from Component V, 28 are from Component VI, and 17 are from Component VII. The majority (57%) are of translucent algalitic chert; and other material types include opaque algalitic chert, obsidian, quartzite, and Whiskey Buttes chert. These points have triangular blade forms with straight to slightly convex edges and corner notches that form barbed or straight shoulders. The stems expand toward the base or are parallel sided. A few have serrated blade margins. Table 45 details the mean, standard deviation, and variance of the measurements for these points. Future research may prove that these small, corner-notched points can be divided into distinct

Table 43. The mean, standard deviation, and variance of large, corner-notched projectile points, Taliaferro site.

	Number	Mean	Standard Deviation	Variance
Length	2	34.5	4.7	22.4
Width	5	20.5	1.3	1.9
Thickness	6	4.3	0.7	0.4
Base Width	4	13.4	3.1	9.9
Neck Width	6	11.3	1.1	1.3
Stem Length	6	7.6	1.4	2.2

temporal types using morphological attributes such as notch angle and stem shape.

In the Great Basin and northern Colorado Plateau, small, corner-notched points usually are grouped into the Rose Spring or Eastgate series. The Rose Spring type was first defined at the Rose Spring site in Inyo County, California, by Lanning (1963), and Eastgate points were named for specimens found at Wagon Jack Shelter (Heizer and Baumhoff 1961). Because the two forms grade into one another, Thomas (1981) believes they should be combined into a single type called the Rosegate series. In southwest Wyoming these points are most often referred to as Rose Spring.

Small, corner-notched points are common throughout the Intermountain West. In the eastern Great Basin and northern Colorado Plateau they occur as early as 1600 years B.P. at Cowboy Cave and are part of the artifact assemblages from the earlier period Fremont sites (Holmer and Weder 1980). Small, side-notched points replace the corner-notched ones at Fremont sites by about 1050-950 years ago. Rosegate points occur between 1250 and 650 years ago in the western Great Basin in areas such as Monitor Valley (Thomas 1981).

Except for two, which are probably out of place, all the remaining small, corner-notched points from the Taliaferro site belong to the Late Prehistoric period components dating between 1500 and 900 years ago. This age span corresponds to the temporal placement of Rose Spring points from the eastern Great Basin and northern Colorado Plateau, as well as from southwest Wyoming. Sites in southwest Wyoming with Rose Spring points include Austin Wash, 48UT779 (Schroedl 1985), 48SW1242 (Hoefer 1986), and Sheehan (Bower et al. 1986).

Side-notched

Seven small points were included in this category; however, much variation exists in their shape and size (Figure 23 u-aa). These points belong to Late Prehistoric components, including two from Component V, one from Component VI, three from Component VII, and one from Component VIII. Material types include three translucent algalitic chert, two quartzite, one opaque algalitic chert, and one obsidian. These points have triangular blade forms with straight to slightly convex edges, and the notches are set fairly low on the sides. The distal portion of the notch is perpendicular to the lateral edge, and the proximal side slopes toward the base. The bases range from concave to slightly convex. One unique specimen (SCL14.4095) from Component VIII has notches that are prependicular to the edges and are higher on the sides than the others (Figure 23aa). It also has a rather deep concave

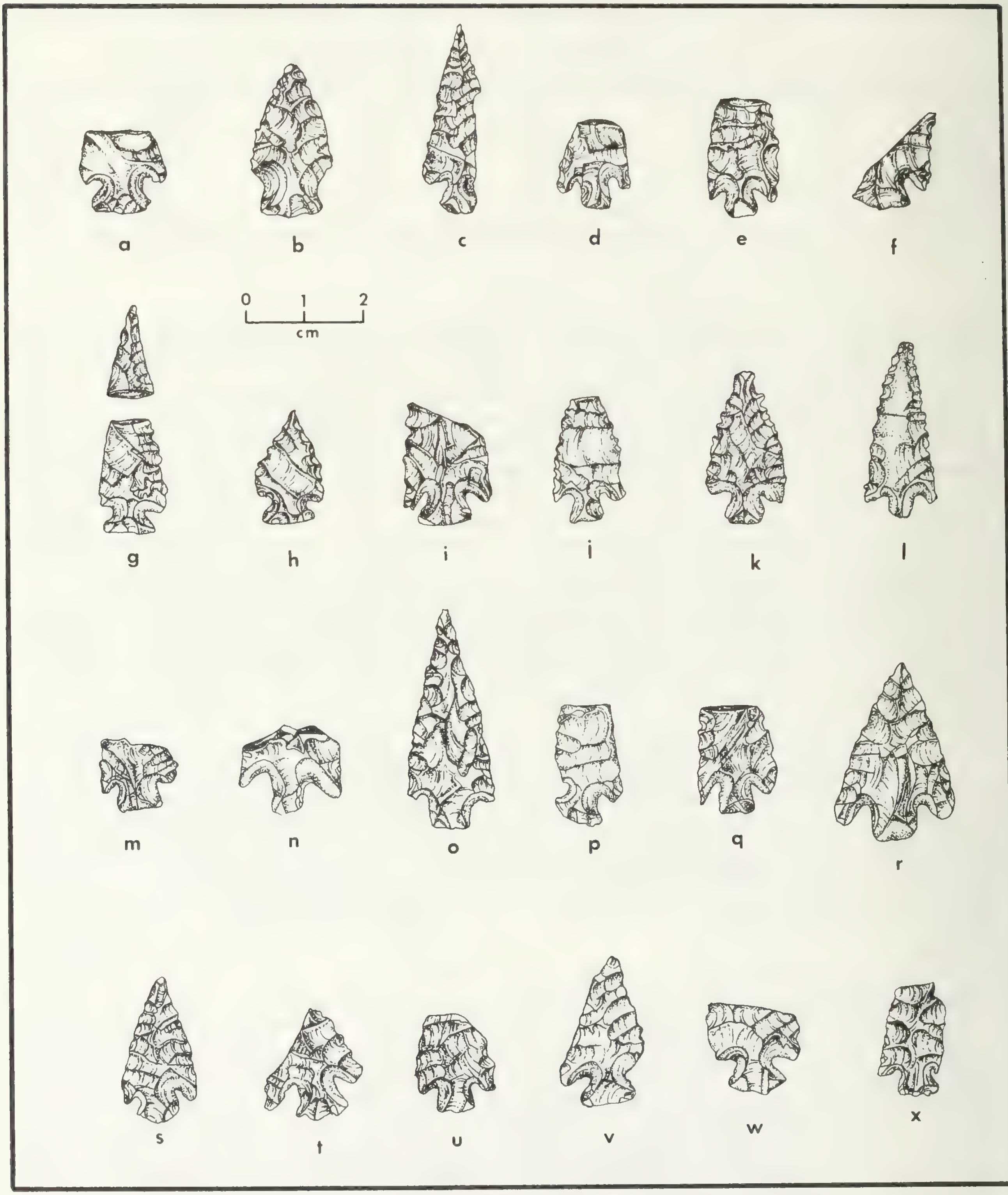


Figure 22. Selected small, corner-notched projectile points from the Taliaferro site. Provenience: Component III, a. SCL14.4885; Component IV, b. SCL14.1061, c. SCL14.1079, d. SCL14.1105, e. SCL14.1106, f. SC.14.1149, g. SCL14.1275, h. SCL14.1276; Component V, i. SCL14.682, j. SCL14.939, k. SCL14.1006, l. SCL14.1008, m. SCL14.1013, n. SCL141069, o. SCL14.1077, p. SCL14.1124, q. SCL14.1289, r. SCL14.1349; Component VI, s. SCL14.2099, t. SCL14.2316, u. SCL14.2437, v. SCL14.2555, w. SCL14.2724, x. SCL14.2797

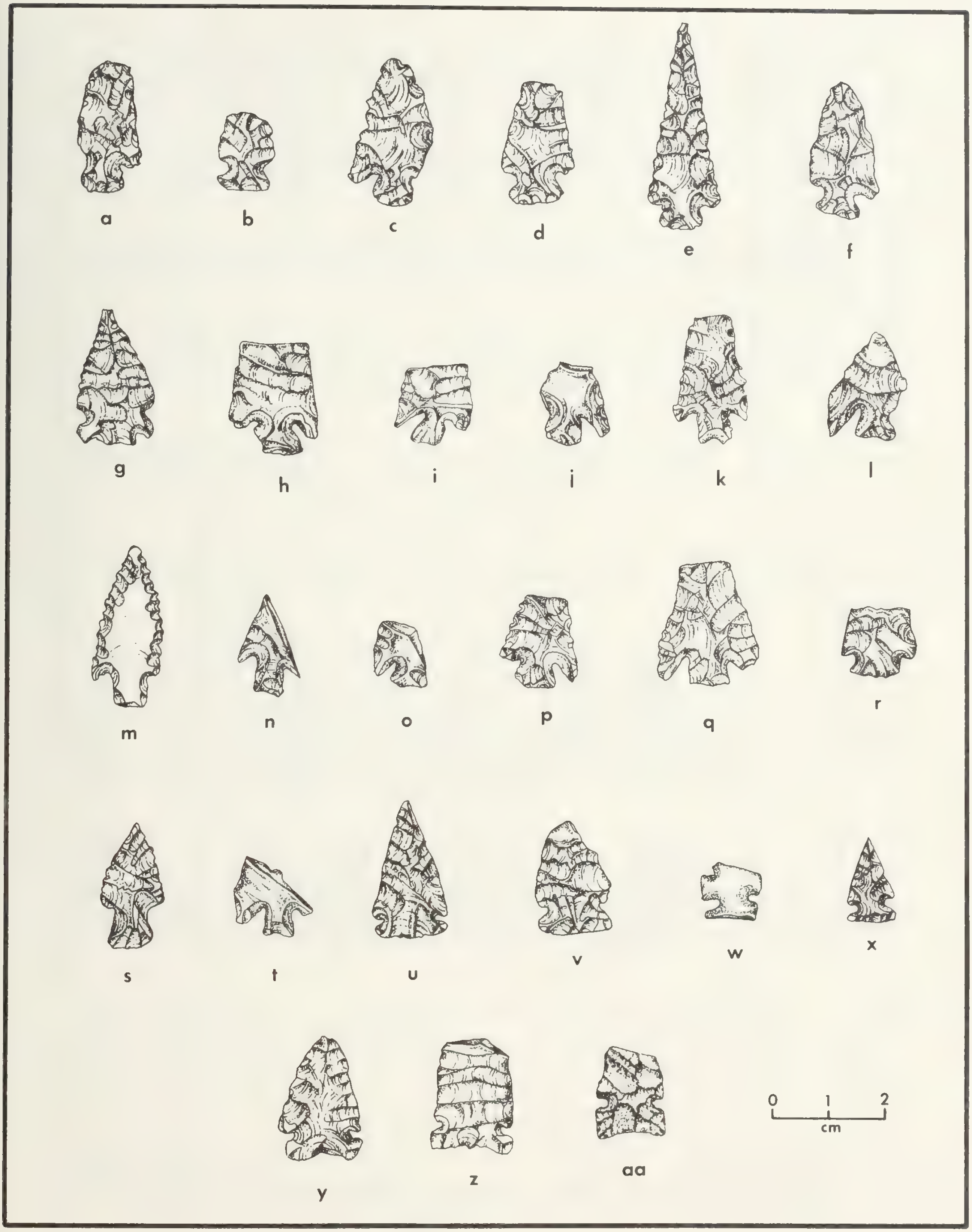


Figure 23. Selected small, corner-notched and side-notched projectile points from the Taliaferro site. a-t, corner-notched; u-aa, side-notched. Provenience: Component VI, a. SCL14.2800, b. SCL14.2806, c. SCL14.2814, d. SCL14.3054, e. SCL14.3155, f. SCL14.4309, g. SCL14.4687, h. SCL14.4792; Component VII, i. SCL14.222, j. SCL14.248, k. SCL14.255, l. SCL14.310, m. SCL14.470, n. SCL14.479, o. SCL14.629, p. SCL14.913, q. SCL14.1028, r. SCL14.1177, s. SCL14.1252, t. SCL14.1207; Component V, u. SCL14.369, v. SCL14.1260; Component VI, w. SCL14.1139; Component VII, x. SCL14.345, y. SCL14.1163, z. SCL14.1206; Component VIII, aa. SCL14.4095.

Table 44. Characteristics of small projectile points by catalog number and type, Taliaferro site.

Catalog Number	Excavation Area	Component	Material Type	Condition	Length (mm)	Width (mm)	Thickness (mm)	Base Width (mm)	Neck Width (mm)	Stem Length (mm)
				Small, Corner-Notched						
470	B	VII	Translucent Chert	Complete	27.0	11.0	1.6	5.2	5.6	5.1
682	B	V	Opaque Chert	Proximal/medial	-	15.1	2.8	7.8	5.2	6.2
683	B	VII	Translucent Chert	Proximal/medial	26.1	-	2.8	5.5	5.4	6.7
1006	B	V	Obsidian	Complete	24.8	13.4	4.1	6.6	5.4	5.6
1013	B	V	Translucent Chert	Proximal/medial	-	12.8	2.6	6.9	6.1	4.5
1069	B	V	Translucent Chert	Proximal/medial	-	17.8	3.2	5.4	5.7	6.9
1077	B	V	Translucent Chert	Complete	35.8	14.8	2.9	6.7	6.9	5.5
1079	B	IV	Translucent Chert	Proximal/medial	30.1	-	2.4	6.1	4.9	4.6
1090	B	IV	Translucent Chert	Complete	25.2	15.6	3.1	7.2	5.4	6.1
1105	B	IV	Translucent Chert	Proximal/medial	-	13.4	2.5	4.8	4.9	5.4
1149	B	IV	Translucent Chert	Proximal/medial	-	-	1.9	9.3	6.2	6.7
1275	B	IV	Translucent Chert	Complete	32.5	12.1	2.2	8.7	5.9	4.5
1276	B	IV	Obsidian	Complete	18.6	11.4	2.8	7.7	5.7	5.7
1289	B	V	Obsidian	Proximal/medial	-	14.2	3.2	5.1	4.5	5.3
1349	B	V	Opaque Chert	Complete	28.9	19.5	3.7	6.9	7.0	6.2
2316	A S½	VI	Translucent Chert	Proximal/medial	-	16.8	2.8	8.1	5.5	6.8
2555	A S½	VI	Translucent Chert	Proximal/medial	23.6	-	1.9	3.3	5.4	4.8
2724	A S½	VI	Opaque Chert	Proximal/medial	-	14.1	2.9	9.1	6.0	6.5
2800	A S½	VI	Translucent Chert	Proximal/medial	-	-	3.6	7.3	6.3	5.8
2806	A S½	VI	Opaque Chert	Proximal/medial	-	9.7	2.9	9.1	6.3	4.3
3054	A S½	VI	Opaque Chert	Proximal/medial	-	11.9	2.4	8.2	6.1	5.4
3155	A S½	VI	Opaque Chert	Complete	34.8	11.4	2.7	6.1	5.7	4.9

Table 44. Continued.

Catalog Number	Excavation Area	Component	Material Type	Condition	Length (mm)	Width (mm)	Thickness (mm)	Base Width (mm)	Neck Width (mm)	Stem Length (mm)
				Small, Corner-Notched (Continued)						
222	B	VII	Opaque Chert	Proximal/medial	-	13.8	3.0	5.5	4.0	5.6
248	B	VII	Obsidian	Proximal/medial	-	-	3.3	6.0	5.0	4.9
255	B	VII	Translucent Chert	Proximal/medial	-	12.5	3.2	6.7	6.0	4.0
310	B	VII	Translucent Chert	Proximal/medial	17.2	-	2.9	6.6	4.5	4.9
479	B	VII	Translucent Chert	Proximal/medial	-	-	2.0	5.6	4.9	5.1
629	B	VII	Translucent Chert	Proximal/medial	-	-	2.1	5.9	4.4	5.0
913	B	VII	Translucent Chert	Proximal/medial	-	13.4	2.1	6.1	5.1	5.4
939	B	V	Translucent Chert	Proximal/medial	-	13.5	2.9	5.6	4.3	4.7
1008,842	B	V	Translucent Chert	Complete	28.2	11.0	3.0	3.6	3.9	3.1
1028	B	VII	Translucent Chert	Proximal/medial	-	17.8	3.1	7.1	6.2	6.0
1106	B	IV	Translucent Chert	Proximal/medial	-	12.5	3.6	5.3	4.6	5.0
1177	B	VII	Translucent Chert	Proximal/medial	-	11.8	2.4	8.1	7.7	3.7
1207	B	VII	Opaque Chert	Proximal/medial	-	-	1.9	5.8	4.9	5.3
2099	A S½	VI	Obsidian	Complete	23.5	12.1	2.8	6.3	5.7	5.0
2222	A S½	VI	Translucent Chert	Proximal/medial	-	13.6	2.5	7.9	5.9	5.4
2246	A S½	VI	Translucent Chert	Proximal/medial	-	14.3	2.8	6.5	5.0	5.9
2324	A S½	VI	Translucent Chert	Complete	29.6	18.7	2.6	6.9	6.1	5.1
2345,2072	A S½	VI	Translucent Chert	Complete	32.1	13.1	2.5	8.8	4.9	6.4
2437	A S½	VI	Translucent Chert	Proximal/medial	-	12.0	3.1	5.9	5.0	4.1
2472	A S½	VI	Opaque Chert	Proximal/medial	-	13.9	3.1	7.1	5.2	5.4

Table 44. Continued.

Catalog Number	Excavation Area	Component	Material Type	Condition	Length (mm)	Width (mm)	Thickness (mm)	Base Width (mm)	Neck Width (mm)	Stem Length (mm)
				Small, Corner-Notched (Continued)						
2797	A S½	VI	Translucent Chert	Proximal/medial	-	-	2.3	6.0	3.9	4.5
2814	A S½	VI	Translucent Chert	Proximal/medial	-	-	2.8	6.2	5.1	5.6
4309	A N½	VI	Translucent Chert	Complete	24.2	12.1	2.4	7.5	5.2	4.5
4792	A N½	VI	Quartzite	Proximal/medial	-	15.0	3.2	-	5.3	5.1
4885	A N½	III	Opaque Chert	Proximal/medial	-	14.1	2.7	8.3	5.8	4.9
221	B	VII	Translucent Chert	Proximal/medial	-	12.9	3.2	-	5.3	4.5
293	B	VII	Translucent Chert	Proximal/medial	-	-	2.7	7.5	4.8	3.8
367	B	V	Translucent Chert	Proximal/medial	-	-	2.1	3.7	3.7	6.1
370	B	V	Quartzite	Proximal/medial	-	-	2.8	5.5	5.1	6.5
403	B	V	Opaque Chert	Proximal/medial	-	13.1	2.8	-	5.7	5.5
627	B	IV	Quartztie	Proximal/medial	-	15.1	2.8	-	6.8	-
654	B	V	Obsidian	Complete	18.1	13.4	2.1	4.5	5.1	5.4
800	B	IV	Translucent Chert	Proximal/medial	-	-	2.4	-	-	-
914	B	VII	Obsidian	Proximal/medial	-	-	2.6	-	6.0	-
1061	B	IV	Obsidian	Complete	24.9	12.5	3.8	9.1	7.9	6.4
1122	B	V	Translucent Chert	Proximal/medial	-	10.1	3.0	5.4	4.9	4.9
1124	B	V	Translucent Chert	Proximal/medial	-	-	2.3	7.8	4.4	6.1
1252	B	VII	Obsidian	Complete	20.1	10.6	2.9	7.8	5.8	7.6
1322	B	VII	Translucent Chert	Proximal/medial	-	13.5	3.2	-	5.6	-
2036	A S½	VI	Opaque Chert	Proximal/medial	-	14.7	3.7	-	5.9	-
2061	A S½	VI	Translucent Chert	Proximal/medial	-	-	2.8	7.1	5.2	5.3
2238	A S½	VI	Opaque Chert	Proximal/medial	-	-	2.6	4.9	4.6	6.7
2288	A S½	VI	Translucent Chert	Proximal/medial	-	14.8	1.5	-	4.7	-

Table 44. Concluded.

Catalog Number	Excavation Area	Component	Material Type	Condition	Length (mm)	Width (mm)	Thickness (mm)	Base Width (mm)	Neck Width (mm)	Stem Length (mm)
				Small, Corner-Notched (Continued)						
2406	A S½	VI	Obsidian	Proximal/medial	-	11.7	2.7	-	4.8	-
2601	A S½	VI	Whiskey Buttes Chert	Proximal/medial	-	13.0	2.3	8.7	5.0	5.8
2643	A S½	VI	Opaque Chert	Proximal/medial	-	-	2.9	-	6.1	5.4
2865	A S½	VI	Opaque Chert	Proximal/medial	-	15.1	3.6	7.8	7.1	7.2
3045	A S½	VI	Opaque Chert	Proximal/medial	-	12.9	2.5	-	4.4	-
4578	A N½	III	Translucent Chert	Proximal/medial	-	13.9	2.6	-	6.4	-
4687	A N½	VI	Obsidian	Complete	24.1	13.4	2.3	13.4	10.5	-
				Small, Side-Notched						
345	B	VII	Obsidian	Complete	15.0	7.8	2.3	8.1	5.0	2.0
369	B	V	Translucent Chert	Complete	23.1	12.1	2.1	12.2	10.6	4.2
1139	B	VIII	Quartzite	Proximal/medial	-	11.9	1.9	9.0	6.2	3.7
1163	B	VII	Translucent Chert	Complete	20.5	12.6	2.4	11.9	9.1	5.4
1206	B	VII	Opaque Chert	Proximal/medial	-	14.1	2.4	14.0	11.1	5.3
1260	B	V	Translucent Chert	Complete	19.3	12.3	2.2	11.5	8.9	4.9
4095	A N½	VI	Quartzite	Proximal/medial	-	11.2	2.4	11.8	8.1	6.4

Note: All catalog numbers have the prefix SCL14.

Table 45. The mean, standard deviation, and variance of small, corner-notched projectile point measurements, Taliaferro site.

	Number	Mean	Standard Deviation	Variance
Length	21	26.2	5.2	27.4
Width	53	13.5	2.0	4.2
Thickness	74	2.7	0.5	0.3
Base width	61	6.9	1.8	3.2
Neck width	73	5.5	1.1	1.1
Stem length	64	5.4	0.9	0.8

base. Table 46 provides the mean, standard deviation, and variance of the measurements for the small, side-notched points.

Generally these points resemble the Uinta Side-notched type that are common at Fremont sites on the northern Colorado Plateau (Holmer and Weder 1980). Uinta Side-notched points date from approximately 1150 to 750 years ago. The small, side-notched points also are similar to the Prairie Side-notched type with an age of about 1250 to 650 years ago on the northern Great Plains (Kehoe 1966). In southwest Wyoming, side-notched points recovered from the Wardell Buffalo Trap with an age of 1580 to 990 years ago (Frison 1973) appear to be like several from the Taliaferro site. The small, side-notched points from the Taliaferro site, which date mostly between 1170 and 960 years ago, correspond to the chronological placement for the types on the Great Plains, the northern Colorado Plateau, and the Great Basin.

The unique specimen (SCL14.4095) from Component VIII resembles Desert Side-notched points found throughout the Intermountain West (Holmer and Weder 1980). They are usually associated with sites belonging to the Shoshoni period. Numerous Desert Side-notched points were recovered from the Eden-Farson site in southwest Wyoming dating to 230 years ago (Frison 1971). The point from Component VIII postdating the 960 year old Component VII has a similar age as the Desert Side-notched type.

HAMMERSTONES AND GROUNDSTONE

Fourteen hammerstones and 65 pieces of groundstone were recovered during the excavations at the Taliaferro site. Artifacts classified as hammerstones display some evidence of battering on one or more edges and contain, at the most, only two scars from accidental flake removal. Ground or pecked sandstone or quartzite was included in the groundstone category.

Hammerstones

Table 47 lists the characteristics of the 14 hammerstones by catalog number. Except for one which is of translucent algalitic chert, all the rest are of quartzite. Three belong to the Early Archaic Component I, one is from the Middle Archaic Component II, two are associated with the Late Archaic Component III, two from the Late Prehistoric Component V, and two are from the Late Prehistoric Component VII. All are unmodified cobbles which have been battered on one or more edges. Hammerstones displaying less evidence of use

Table 46. The mean, standard deviation, and variance of small, side-notched projectile point measurements, Taliaferro site.

	Number	Mean	Standard Deviation	Variance
Length	4	19.5	3.4	11.4
Width	5	11.8	2.4	5.6
Thickness	5	2.3	0.1	0.1
Base width	5	11.5	2.1	4.6
Neck width	5	8.9	2.4	5.7
Stem length	5	4.4	1.4	2.0

may have gone unnoticed during the excavations because of the tremendous amount of cobbles and fire-cracked rock encountered throughout the cultural deposits.

Hammerstones in the collection vary greatly in size, from 119.4 to 49.1 mm in length, 87.2 to 27.3 mm in width, and 42.2 to 17.3 mm in thickness. The mean, standard deviation, and variance of these measurements are shown in Table 48.

Groundstone

The 65 pieces of groundstone were divided into seven types--abrading stones, shaped manos, unshaped manos, basin metates, shaped slab metates, unshaped slab metates, and indeterminate groundstone--based on size and the presence or absence of intentional shaping. Table 49 details their characteristics by type and catalog number. Because most specimens are fragments, statistical comparisons of their measurements were not performed. Except in a couple of cases, most appear to be pieces of different grinding implements.

Fifty-six (86.2% of the total) specimens are of sandstone, and the remaining nine are quartzite. As is evident from Table 50, the majority, or 85% of the groundstone, was recovered from the Late Prehistoric Components V-VII. Of the remaining ten pieces, seven are from the Late Archaic Component III; two are associated with Component I, and one is associated with Component II. Each groundstone type is briefly discussed below.

Abrading Stone

One grooved abrading stone was recovered from the Late Prehistoric Component VII of Excavation Area B (Table 50; Figure 24a). This artifact is made of sandstone and has a single longitudinal groove down the middle of one surface. The remaining sides are shaped and smoothed from grinding.

Shaped Manos

Ten specimens were classified as shaped manos (Figure 24 b-d). Except for two, which are associated with the Late Archaic Component III, all of the rest belong to the Late Prehistoric Components V-VII (Table 49). Seven are of quartzite and three are of sandstone. All are fragments, though at least half of the original artifact remains of most. All appear to represent individual implements. These fairly thick artifacts have been deliberately shaped by grinding or pecking and have parallel longitudinal margins that form an oblong outline. Six have bifacial working (ground) faces and four have a unifacial

Table 47. Characteristics of hammerstones by catalog number, Taliaferro site.

Catalog Number	Excavation Area	Component	Material Type	Length (mm)	Width (mm)	Thickness (mm)
235	B	VII	Translucent Chert	52.4	27.3	19.0
461	B	VII	Quartzite	62.1	56.9	42.2
475	B	VII	Quartzite	49.1	43.2	21.8
520	B	V	Quartzite	-	33.6	17.3
720	B	VII	Quartzite	80.5	78.0	41.5
983	B	V	Quartzite	-	52.5	26.5
1026	B	VII	Quartzite	84.9	45.7	23.4
1030	B	VII	Quartzite	72.6	54.3	39.2
3081	A S½	III	Quartzite	60.8	36.9	27.4
3192	A S½	III	Quartzite	58.4	38.7	23.4
4092	A N½	I	Quartzite	64.1	59.2	21.4
5186	A N½	II	Quartzite	62.8	45.9	24.3
4534	A N½	I	Quartzite	74.9	56.0	34.1
4978	A N½	I	Quartzite	119.4	87.2	38.4

Note: All catalog numbers have the prefix SCL14.

Table 48. The mean, standard deviation, and variance of hammerstone measurements, Taliaferro site.

	Number	Mean	Standard Deviation	Variance
Length	12	70.1	18.8	356.1
Width	14	51.1	16.4	269.9
Thickness	14	28.5	8.7	75.8

working face. The sample averages 54.0 mm in width and 36.7 mm in thickness. Most display use striations and polish.

Unshaped Manos

Only two artifacts recovered from the Taliaferro site were considered unshaped manos (Figure 25a). One is from the Late Archaic Component III, and the other is associated with the Late Prehistoric Component VII (Table 50). These fairly thick implements have an irregular outline and are unmodified pieces of sandstone that have a single ground working surface. The complete mano (SCL14.297) measures 119.0 x 91.4 x 41.7 mm and displays grinding and pecking. The other (SCL14.4183) is a fragment and is 42.4 mm thick.

Basin Metate

A single complete basin metate was found in the wall of the 1984 backhoe trench in the south half of Excavation Area A (Figure 26). Though not recovered during the controlled excavations, it appears to be associated with the Late Prehistoric Component VI (Table 50). The margins of this large slab have been shaped by pecking and flaking, and it is oblong in outline. The working surface has been ground and pecked into a shallow basin. It measures 370.0 x 210.0 x 60.0 mm. Two other large slab metates were recovered from the same backhoe trench, but because their exact provenience is unknown, they were not considered in the analysis.

Shaped Slab Metates

Ten artifacts were included in the category of shaped slab metates (Figure 25 b-c; Figure 27a). All belong to the Late Prehistoric Components V-VII (Table 50) and all are made from sandstone slabs. These grinding implements are thinner in relation to their length and width than are manos. The average thickness is 30.1 mm. The edges have been deliberately shaped by grinding and pecking. The one complete specimen (SCL14.645) is ovate in outline; however, it is much narrower than the others. The remaining nine are fragments. Three specimens from Component VII (SCL14.715-717) appear to be pieces of a single implement, and three fragments from Component VI (SCL14.2429-2431) are fragments of one artifact. Except for the three bifacially ground fragments from Component VII that are pieces of the same tool, all display evidence of grinding on only one surface.

Unshaped Slab Metates

Eight grinding implements from the Taliaferro site were classified as unshaped slab metates (Figure 27 b-c). Except for one, which is from the Late Archaic Component III, all the others are from the Late Prehistoric Components IV-VII (Table 49). These artifacts consist of thin pieces of unmodified sandstone slabs which have been ground or pecked on one surface. They are the thinnest of the groundstone artifacts with a mean thickness of 13.6 mm and a range between 22.0 and 4.0 mm. All are fragments and appear to be pieces from different metates. They are generally irregular in outline based on the recovered fragments. Some have been only slightly ground.

Indeterminate Groundstone

The remaining 33 specimens were too fragmentary for classification into one of the above categories. At least one was found in each component at the site, but the majority, 27 of the 33, are from the Late Prehistoric Components IV-VII (Table 50). Except for one quartzite specimen, all others are of sandstone. One is bifacially ground. Most appear to be small pieces of unshaped slab metates.

OTHER ARTIFACTS

The following artifacts recovered from the Taliaferro site are of a nonutilitarian nature. These include four stone beads, a piece of incised sandstone, a single shell bead, and two bone bead fragments (Figure 28). A brief description of each specimen is provided below.

Table 49. Characteristics of groundstone by catalog number and type, Taliaferro site.

Catalog Number	Excavation Area	Component	Material Type	Condition	Type of Modification	Area of Modification	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)
Abrading Stone										
230	B	VII	Sandstone	Complete	Ground	Bifacial	62.8	31.9	29.6	81.8
Shaped Manos										
573	B	VII	Sandstone	Fragment	Ground, pecked	Unifacial	41.9	64.6	40.4	115.5
574	B	VII	Quartzite	Fragment	Ground	Unifacial	60.4	55.9	35.6	125.4
779	B	IV	Quartzite	Fragment	Ground, pecked	Unifacial	104.6	81.0	46.4	702.8
1279	B	V	Sandstone	Fragment	Ground	Unifacial	71.5	89.1	36.5	327.8
2223	A S½	III	Quartzite	Fragment	Ground, pecked	Bifacial	76.7	71.1	31.0	306.7
2433	A S½	VI	Quartzite	Fragment	Ground, pecked	Bifacial	74.5	67.8	37.9	295.4
2588	A S½	VI	Quartzite	Fragment	Ground	Bifacial	81.9	74.0	43.8	324.5
2694	A S½	VI	Sandstone	Fragment	Ground	Bifacial	47.2	40.7	27.1	69.7
3097	A S½	VI	Quartzite	Fragment	Ground, pecked	Bifacial	46.0	47.3	35.2	114.1
3107	A S½	III	Quartzite	Fragment	Ground, pecked	Bifacial	80.8	60.5	33.9	205.3
Unshaped Manos										
297	B	VII	Sandstone	Complete	Ground, pecked	Unifacial	119.0	91.4	41.7	643.4
4183	A N½	III	Sandstone	Fragment	Ground	Unifacial	76.4	61.9	42.4	328.1
Basin Metate										
2627	A S½	VI	Quartzite	Complete	Ground, pecked	Unifacial	370.0	210.0	60.0	-
Shaped Slab Metates										
645	B	VII	Sandstone	Complete	Ground, pecked	Unifacial	267.5	97.1	35.5	1747.4
715	B	VII	Sandstone	Fragment	Ground, pecked	Bifacial	116.0	111.0	36.5	640.1
716	B	VII	Sandstone	Fragment	Ground, pecked	Bifacial	125.0	110.0	45.0	727.6
717	B	VII	Sandstone	Fragment	Ground, pecked	Bifacial	127.0	100.0	38.0	550.5
718	B	VII	Sandstone	Fragment	Ground, pecked	Unifacial	104.0	102.5	33.5	342.1
1101	B	V	Sandstone	Fragment	Ground, pecked	Unifacial	119.1	75.1	23.2	519.1
2383	A S½	VI	Sandstone	Fragment	Ground, pecked	Unifacial	110.9	53.5	16.7	144.8
2429	A S½	VI	Sandstone	Fragment	Ground, pecked	Unifacial	127.2	108.8	16.9	409.4
2430	A S½	VI	Sandstone	Fragment	Ground, pecked	Unifacial	98.2	62.8	27.6	266.5
2431	A S½	VI	Sandstone	Fragment	Ground, pecked	Unifacial	135.0	111.9	27.9	590.0

Table 49. Continued.

Catalog Number	Excavation Area	Component	Material Type	Condition	Type of Modification	Area of Modification	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)
				Unshaped Slab Metates						
546	B	VII	Sandstone	Fragment	Ground	Unifacial	169.5	112.9	15.6	211.5
628	B	IV	Sandstone	Fragment	Ground, pecked	Unifacial	93.0	75.1	16.9	169.0
1301	B	V	Sandstone	Fragment	Pecked	Unifacial	113.2	80.4	17.1	220.0
1346	B	IV	Sandstone	Fragment	Ground	Unifacial	225.0	154.0	14.1	833.3
2385	A S½	VI	Sandstone	Fragment	Ground, pecked	Unifacial	100.1	86.7	22.0	270.5
2815	A S½	III	Sandstone	Fragment	Pecked	Unifacial	221.5	123.5	13.2	525.9
2840	A S½	VI	Sandstone	Fragment	Ground	Unifacial	141.0	78.0	6.4	91.9
2886	A S½	VI	Sandstone	Fragment	Ground	Unifacial	86.1	87.7	4.0	163.5
				Indeterminate Groundstone						
239	B	VII	Sandstone	Fragment	Ground	Unifacial	60.0	44.5	11.0	33.6
247	B	VII	Sandstone	Fragment	Ground	Unifacial	53.8	46.6	14.6	59.9
273	B	VII	Sandstone	Fragment	Ground	Unifacial	44.9	25.8	9.2	17.6
336	B	VII	Sandstone	Fragment	Ground	Unifacial	57.1	46.7	33.8	93.3
532	B	V	Sandstone	Fragment	Ground, pecked	Unifacial	59.7	44.6	16.2	55.6
695	B	V	Sandstone	Fragment	Ground, pecked	Unifacial	52.9	44.3	31.1	114.5
767	B	IV	Sandstone	Fragment	Ground	Unifacial	58.9	57.4	21.1	131.8
768	B	IV	Sandstone	Fragment	Ground	Unifacial	40.5	34.7	13.3	24.0
818	B	IV	Quartzite	Fragment	Ground	Unifacial	57.3	44.9	21.9	80.6
870	B	VII	Sandstone	Fragment	Ground	Unifacial	45.8	34.8	20.8	31.5
991	B	V	Sandstone	Fragment	Ground	Unifacial	72.8	61.7	19.4	164.2
1055	B	V	Sandstone	Fragment	Ground	Unifacial	52.5	47.3	16.2	50.3
1110	B	IV	Sandstone	Fragment	Ground	Unifacial	65.9	54.8	20.8	131.8
1232	B	V	Sandstone	Fragment	Ground	Unifacial	91.4	66.4	17.4	168.2
1233	B	IV	Sandstone	Fragment	Ground	Unifacial	49.1	31.5	15.3	26.2
1273	B	IV	Sandstone	Fragment	Ground	Unifacial	36.9	32.1	16.0	30.2
1274	B	IV	Sandstone	Fragment	Ground, pecked	Unifacial	55.3	49.1	26.5	89.5
1282	B	VII	Sandstone	Fragment	Ground, pecked	Unifacial	63.9	50.8	10.9	58.0
1292	B	V	Sandstone	Fragment	Ground, pecked	Unifacial	96.4	52.4	28.0	170.1
1308	B	V	Sandstone	Fragment	Ground	Unifacial	59.6	49.5	12.5	36.9
1363	B	V	Sandstone	Fragment	Ground	Unifacial	79.4	77.3	29.5	255.6
1401	B	IV	Sandstone	Fragment	Ground, pecked	Unifacial	68.6	47.9	17.0	75.8
1409	B	IV	Sandstone	Fragment	Ground, pecked	Unifacial	106.1	58.4	31.8	303.0
2301	A S½	III	Sandstone	Fragment	Ground, pecked	Unifacial	50.4	47.1	21.6	73.8
2302	A S½	III	Sandstone	Fragment	Ground, pecked	Unifacial	92.2	48.8	18.4	124.5

Table 49. Concluded.

Catalog Number	Excavation Area	Component	Material Type	Condition	Type of Modification	Area of Modification	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)
					Indeterminate Groundstone (Continued)					
2432	A S½	VI	Sandstone	Fragment	Ground, pecked	Unifacial	88.6	25.5	16.9	38.8
2565	A S½	VI	Sandstone	Fragment	Ground	Unifacial	61.3	54.1	18.4	102.8
2654	A S½	VI	Sandstone	Fragment	Ground	Unifacial	64.9	45.4	30.9	96.8
2687	A S½	III	Sandstone	Fragment	Ground	Unifacial	34.3	27.5	18.5	25.1
3129	A S½	VI	Sandstone	Fragment	Ground	Bifacial	75.4	41.4	15.0	85.8
4662	A N½	II	Sandstone	Fragment	Ground	Unifacial	50.5	49.6	17.0	43.4
4956	A N½	I	Sandstone	Fragment	Ground, pecked	Unifacial	67.1	57.4	29.5	163.4
5176	A N½	I	Sandstone	Fragment	Ground	Unifacial	80.9	76.0	15.6	108.9

Note: All catalog numbers have the prefix SCL14.

Table 50. Crosstabulation of groundstone type by component, Taliaferro site.

		Groundstone Type							
Component		Abrading Stone	Shaped Manos	Unshaped Manos	Basin Metate	Shaped Slab Metates	Unshaped Slab Metates	Indeterminate Groundstone	Total
I	#	0	0	0	0	0	0	2	2
	Row %	0	0	0	0	0	0	100.0	3.1
	Column %	0	0	0	0	0	0	6.1	
	Total %	0	0	0	0	0	0	3.1	
II	#	0	0	0	0	0	0	1	1
	Row %	0	0	0	0	0	0	100.0	1.5
	Column %	0	0	0	0	0	0	3.0	
	Total %	0	0	0	0	0	0	1.5	
III	#	0	2	1	0	0	1	3	7
	Row %	0	28.6	14.3	0	0	14.3	42.9	10.8
	Column %	0	20.0	50.0	0	0	12.5	9.1	
	Total %	0	3.1	1.5	0	0	1.5	4.6	
IV	#	0	1	0	0	0	2	9	12
	Row %	0	8.3	0	0	0	16.7	75.0	18.5
	Column %	0	10.0	0	0	0	25.0	27.3	
	Total %	0	1.5	0	0	0	3.1	13.8	
V	#	0	1	0	0	1	1	8	11
	Row %	0	9.1	0	0	9.1	9.1	72.7	16.9
	Column %	0	10.0	0	0	10.0	12.5	24.2	
	Total %	0	1.5	0	0	1.5	1.5	12.3	
VI	#	0	4	0	1	4	3	4	16
	Row %	0	25.0	0	6.3	25.0	18.8	25.0	24.6
	Column %	0	40.0	0	100.0	40.0	37.5	12.1	
	Total %	0	6.2	0	1.5	6.2	4.6	6.2	
VII	#	1	2	1	0	5	1	6	16
	Row %	6.3	12.5	6.3	0	31.3	6.3	37.5	24.6
	Column %	100.0	20.0	50.0	0	50.0	12.5	18.2	
	Total %	1.5	3.1	1.5	0	7.7	1.5	9.2	
Total	#	1	10	2	1	10	8	33	65
	%	1.5	15.4	3.1	1.5	15.4	12.3	50.8	100.0

Stone Beads

Four small, flat, circular stone beads were recovered from the Taliaferro site (Figure 28 a-d); one is from Component IV, another is from Component V, and two are from Component VI, all dating to the Late Prehistoric period. The beads range from 3.7 to 10.5 mm in diameter and from 0.9 to 2.1 mm in thickness with a hole diameter between 1.1 and 3.6 mm (Table 51). The material appears to be antigorite, a type of serpentine commonly known as asbestos (Miller, 1986). Most of the beads are fairly symmetrical with the hole placed evenly in the center. Similar stone beads have been found in the Green River Basin at the Austin Wash site (Schroedl 1985) and the Wardell Buffalo Trap (Frison 1973).

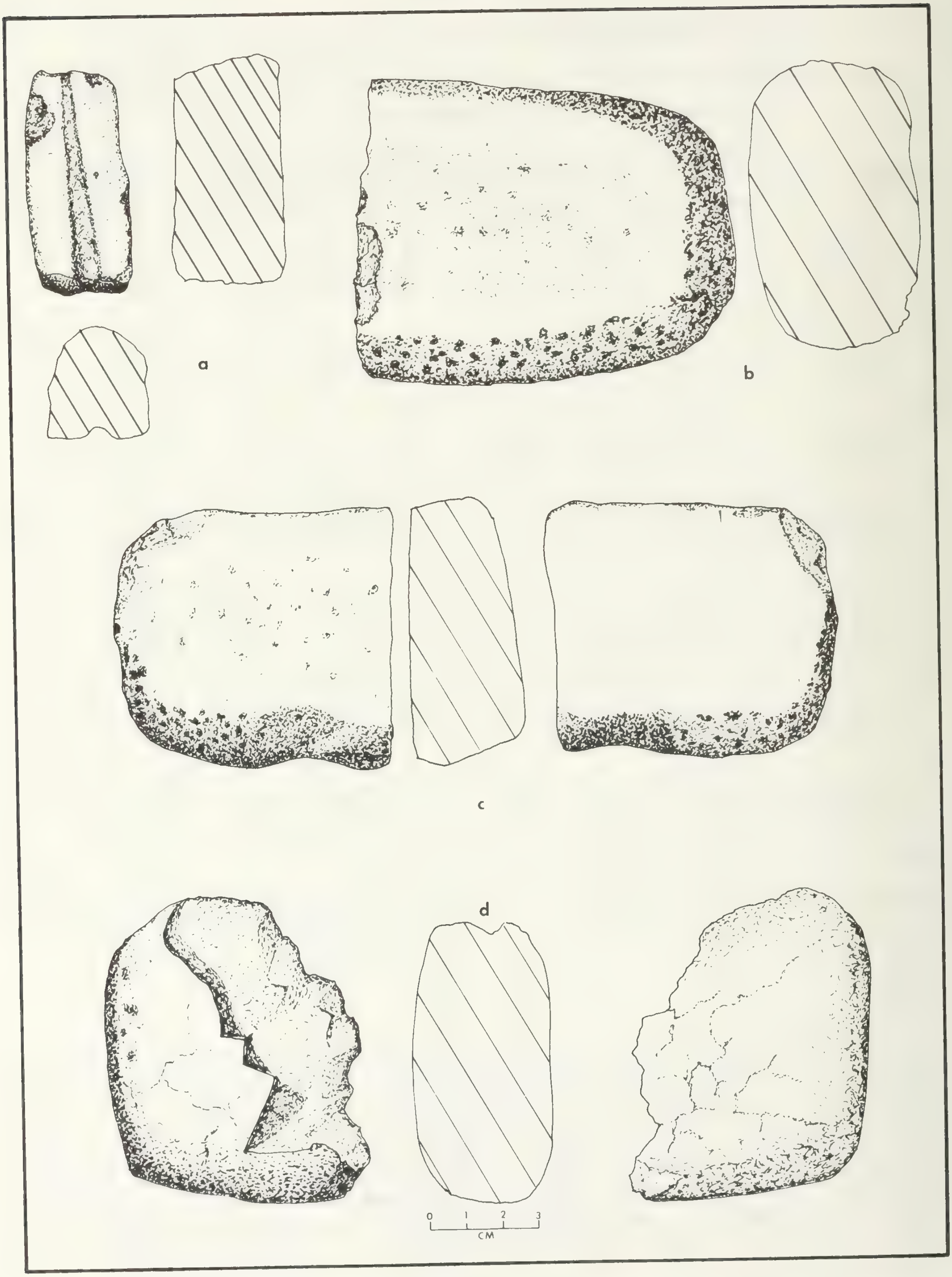


Figure 24. Abrading stone and selected shaped manos from the Taliaferro site. a, abrading stone; b-d, shaped manos. Provenience: Component III, c. SCL14.2223; Component IV, b. SCL14.779; Component VI, d. SCL14.2588; Component VII; a. SCL14.230.

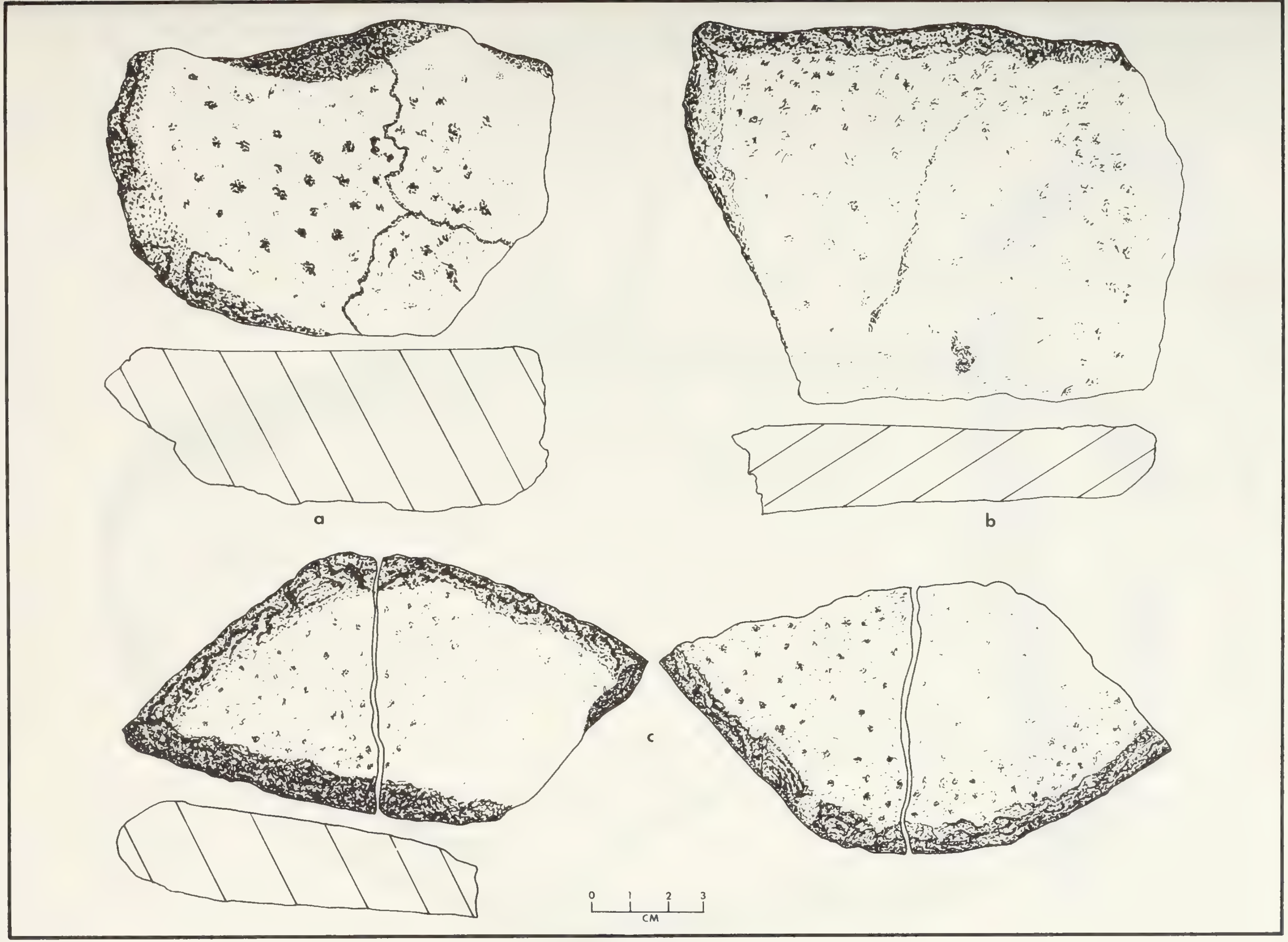


Figure 25. Selected unshaped mano and shaped slab metates from the Taliaferro site. a, unshaped mano; b-c, shaped slab metates. Provenience: Component VI, b. SCL14.2431; Component VII, a. SCL14.297, c. SCL14.715,717.

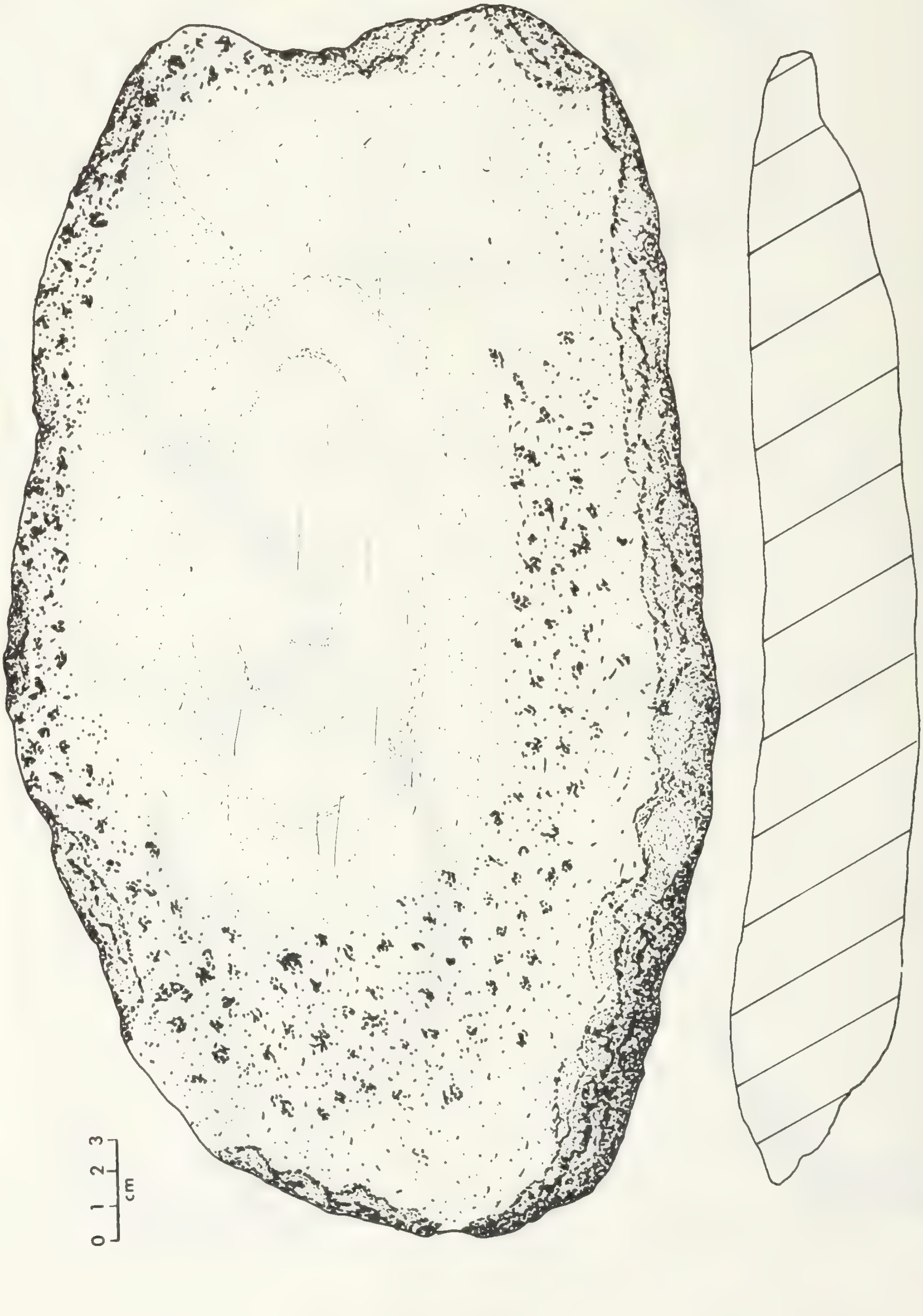


Figure 26. Basin metate from the Taliaferro site. Provenience: Component VI, SCL14.2627.

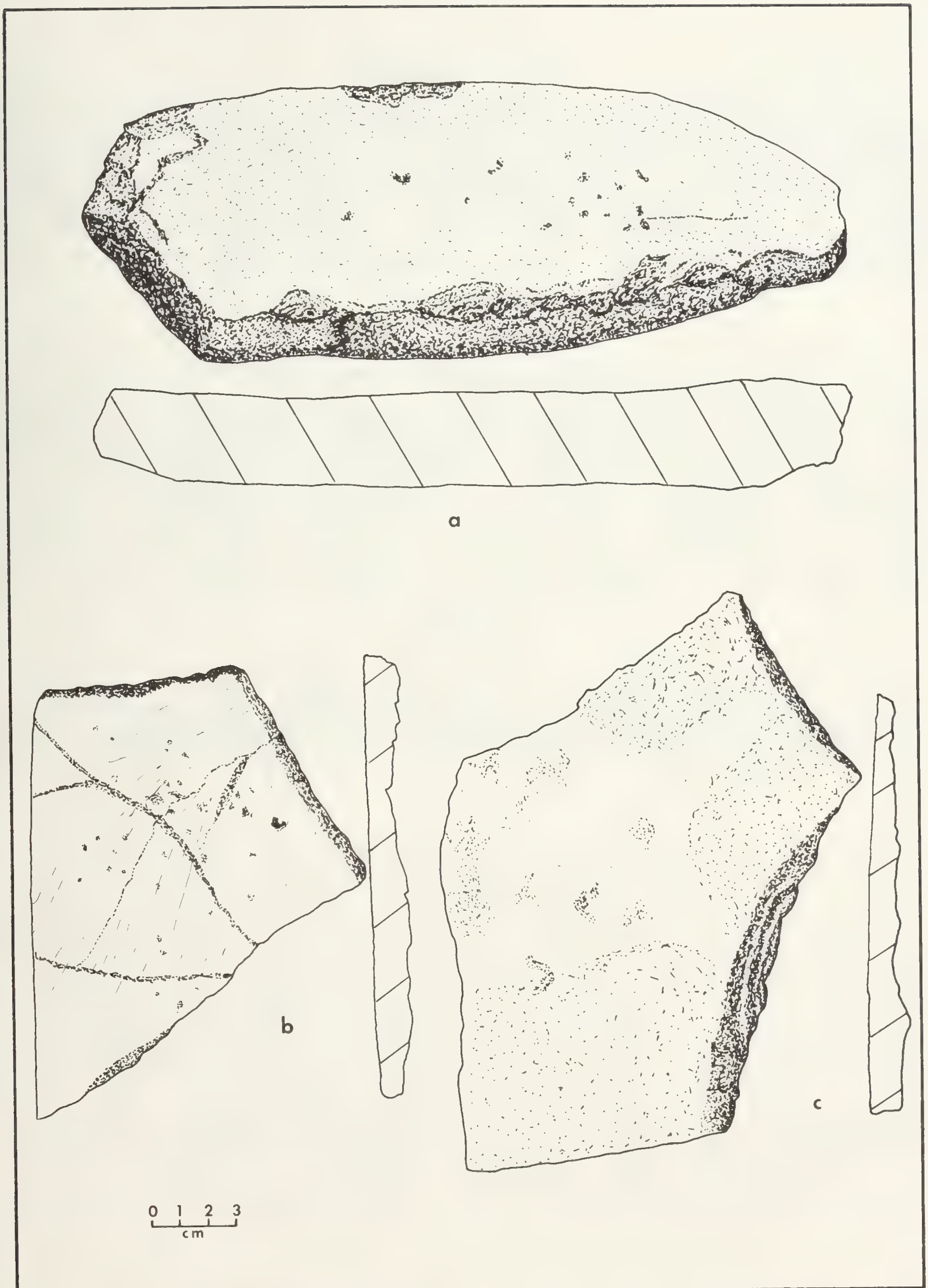


Figure 27. Selected shaped and unshaped slab metates from the Taliaferro site. a, shaped slab metate; b-c, unshaped slab metates. Provenience: Component III, c. SCL14.2815; Component VII, a. SCL14.645, b. SCL14.546.

Incised Sandstone

One fragmentary piece of incised sandstone (SCL14.1442) was found in the fill of Feature 30, the large, stratified basin belonging to the Late Prehistoric Component VI of the south half of Excavation Area A (Figure 28e). The incising consists of seven parallel lines across one surface of a tabular piece of sandstone measuring 14.5 x 11.6 x 3.3 mm. The incised lines are about 1 mm apart. The two unbroken sides of the fragment are rounded and smoothed and display striations and polish. The artifact appears to be a portion of a pendant.

Shell Bead

One olive shell (*Olivella biplicata*) bead (SCL14.1158) was found in Component VIII associated with a small, side-notched (Desert side-notched) projectile point in Excavation Area B (Figure 28f). The spire has been ground off perpendicular to the long axis of the shell forming what Bennyhoff and Hughes (1983) refer to as a "spire-lopped bead." No other modifications, such as aperture grinding or incising, are evident on the shell. Its maximum diameter is 6.1 mm, and it is 13.5 mm in length. The perforation is 2.2 mm in diameter. A similar shell bead was recovered from the Wardell Buffalo Trap in the upper Green River Basin (Frison 1973) and another was found at the Eden-Farson site, a Protohistoric Shoshonean campsite (Frison 1971).

Bone Beads

Two bone bead fragments were found at the Taliaferro site; a tubular bead fragment (SCL14.1458) belonging to the Late Prehistoric Component V in Excavation Area B and a disk bead fragment (SCL14.3242) in Feature 30, the large stratified basin from Component VI. The following descriptions are provided by Lynn Harrell.

Table 51. Characteristics of the stone beads, Taliaferro site.

Catalog Number	Excavation Area	Component	Diameter (mm)	Thickness (mm)	Hole Diameter (mm)
1091	B	IV	10.5	2.1	3.6
1425	B	V	3.7	0.9	1.1
2644	A S½	VI	8.2	1.5	2.0
3241	A S½	VI	6.4	1.8	2.5

Note: all catalog numbers have the prefix SCL14.

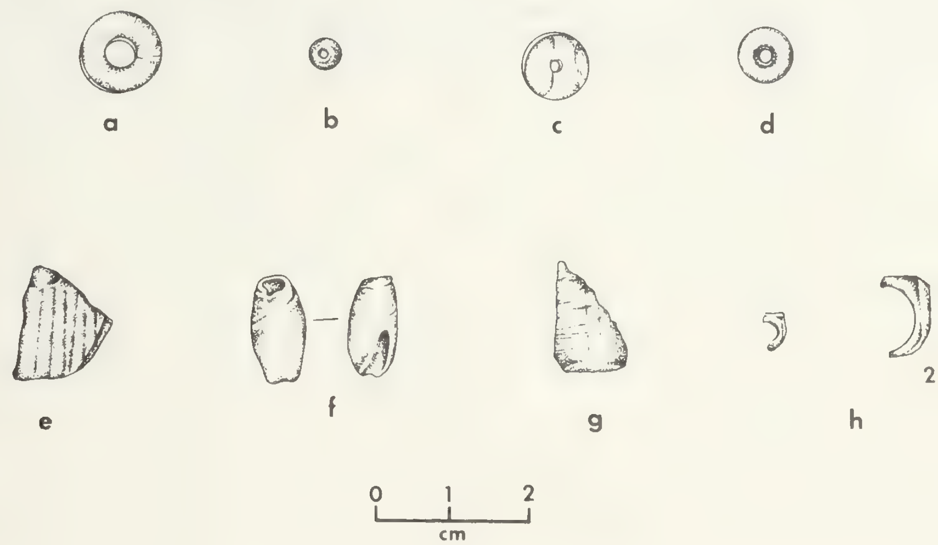


Figure 28. Nonutilitarian artifacts from the Taliaferro site. a-d, stone beads; e. incised sandstone; f. shell bead; g-h. bone beads. Provenience: Component IV, a. SCL14.1091; Component V, b. SCL14.1425, g. SCL14.1458; Component VI, c. SCL14.2644, d. SCL14.3241, e. SCL14.1442, h. SCL14.3242; Component VII, f. SCL14.1158.

The tubular bead fragment consists of a third of one end and an adjoining portion of the side (Figure 28g). It appears to have been made from a bone with a fairly uniform round cross section, such as a long bone shaft of a medium-sized mammal or a phalange shaft of a small Artiodactyl. The bead end exhibits evidence of the groove-and-snap method of manufacture, and it has been smoothed and polished. The exterior surface has numerous unpatterned scratches oriented roughly parallel to the bead end, probably created during manufacture. The fragment measures 13.7 x 9.1 x 1.9 mm.

The other specimen is half of a small disk bead made from a long bone shaft fragment of a small mammal, possibly a metapodial of a rabbit (Figure 28h). One edge is highly polished, eliminating any evidence of the manufacture technique. The other end displays the rough remnants of a groove that was cut transverse to the long axis of the shaft, indicating the groove-and-snap method of production. This edge is unpolished, which suggests that the bead was broken during manufacture. The fragment is 2.3 mm in thickness with an exterior diameter of 4.5 mm and an interior diameter of 3.2 mm.

Bone beads or remnants of the groove-and-snap method of manufacture occur at several Late Prehistoric sites or components in southwest Wyoming. At the Austin Wash site in the Green River Basin, nine bone shaft fragments were found that display evidence of this method of production (Schroedl 1985). The specimens include a coyote/dog humerus, two antelope first phalanges, two coyote/dog tibia fragments, a coyote/dog metapodial, and a coyote/dog phalange. These pieces are probably the discarded waste material from the manufacture of bone beads or tubes. The Eden-Farson (Frison 1971) and Wardell (Frison 1973) sites are among others in the area that contain bone beads.

APPENDIX C

PLANT MACROFOSSIL ANALYSIS

By C. S. Smith

INTRODUCTION

Samples of fill representing the 31 pit features at the Taliaferro site were floated and examined for plant macrofossils. Each sample consisted of 1.5 to 22.5 liters of fill. A total of 4650 charred seeds or fruits was recovered and identified to 19 taxa. The majority of the plant macrofossils belong to weedy species with those in the Chenopodiaceae family dominating the collection. Many of these species are "camp followers" that thrive in human disturbed environments. To ensure a ready food supply, the prehistoric inhabitants of the area may actually have encouraged some of these taxa by using such methods as burning off the vegetation to create a suitable environment for invasion of the pioneer weedy species or by broadcasting their seeds. In southwest Wyoming, seeds from many of these plants are ripe and available in the late summer or fall, which indicates an occupation for the site at least during these seasons. This is especially true for the Late Prehistoric period and occupations.

Except for the Middle Archaic Component II, all components represented at the site yielded charred plant macrofossils. The largest number and widest variety came from features dating to each of the Late Prehistoric components. Only a single sedge seed was found in the Early Archaic Component I, but the Late Archaic Component III contained 34 seeds of which 33 were identified as goosefoot. The recovery of charred plant macrofossils of weedy species from primarily the Late Prehistoric components at the Taliaferro site is consistent with the pattern observed at other excavated sites in the Wyoming Basin.

METHODS

The 31 samples were processed using an Archaeon water flotation device. This machine consists of a small, plastic reservoir which is connected to a water hose. Each sample was placed into the water-filled reservior while incoming water from the hose agitated and swirled the sediment causing the organic fraction to float off into a fine-meshed geologic sieve (Sieve No. 60). The residue from each sample was then air dried and examined under a binocular dissecting microscope at 20x magnification. The charred plant macrofossils were removed and identified using seed manuals (Albee 1980; Martin and Barkley 1961) and seed reference collections at Western Wyoming College and the herberiums at the University of Wyoming and University of Utah.

To avoid faulty interpretations due to contamination from the modern seed rain, only charred plant remains are considered prehistoric in this analysis. Seeds are produced in enormous quantities and are naturally deposited by such means as root holes, drying cracks, downwashing, and burrowing organisms (Keepax 1977). Generally, under normal environmental conditions, these uncharred seeds will decompose in less than a century after deposition (Minnis 1981). For this analysis the term "seed" is used in the common sense and includes fruits such as achenes.

RESULTS

The fill samples from 23 of the 31 pit features from the Taliaferro site examined during this analysis yielded charred seeds identified to 19 different taxa (Table 1). All components, except the Middle Archaic Component II, produced at least one plant macrofossil. In Component I, dating to about 5200 years B.P., a single sedge (Carex sp.) seed was recovered from Feature 25, a small basin; the other feature examined from this component lacked seeds. A total of 34 specimens was found among three of the six features analyzed for Component III with an age between 2800 and 1900 years ago. Most, 29 goosefoot (Chenopodium sp.) seeds, came from the fill of Feature 36, an irregular-shaped pit associated with a rock-filled basin, Feature 37. An additional three goosefoot seeds were present in Feature 20, a medium basin. The remaining two specimens, a goosefoot and a Cruciferae (mustard) seed, were from Feature 28, another rock-filled basin.

By far, most of the charred plant macrofossils recovered from the Taliaferro site were from the four Late Prehistoric components. The earliest, Component IV dating to 1500 years ago, produced the most variety, 14 of the 19 taxa identified during this analysis. All nine features examined contained charred macrofossils, and goosefoot dominated the collection. Feature 15, an oxidized basin, produced the most for this component, including 892 goosefoot and 121 Cruciferae seeds. Among the other taxa occurring in this feature, as well as others from Component IV, are saltbush (Atriplex sp.), greasewood (Sarcobatus vermiculatus), sunflower (Helianthus sp.), and sedge. The only mint (Mentha sp.) seeds for the site also were found in Feature 15. Beeweed (Cleome sp.) dominates the plant macrofossil collection from Feature 26, a medium basin. It is also present in small quantities in four other features belonging to this component. Of the four seeds from Feature 6, an oxidized basin, two are strawberry (Fragaria sp.). These were the only strawberrys recovered at the site. Monolepis (Monolepis nuttalliana) seeds were found in small numbers in four of the features. Other taxa identified for Component IV include a single Indian ricegrass (Oryzopsis hymenoides) seed from Feature 5, one seed of poverty sumpweed (Iva axillaris) from Feature 26, an unidentified grass (Gramineae) seed from Feature 16, and an unknown taxon from three features.

Each of the five pit features belonging to Component V examined during this analysis yielded charred plant macrofossils. This component dates to about 1300 years ago. Twelve different taxa were identified from the collection, which is dominated by goosefoot. Except for Feature 14, a rock-filled pit, goosefoot is the most common taxa in all other features. Beeweed dominates in Feature 14, and a single seed also occurs in Feature 24, an irregular-shaped pit. Saltbush seeds are present only in Feature 9, a bell-shaped pit, and monolepis was found only in Feature 14. Taxa occurring in small quantities are Cruciferae in three features, sunflower in two features, sedge in two features, Indian ricegrass in one feature, Gramineae in two features, lily (Liliaceae) in two features, and an unknown taxon in three features. Buttercup (Ranunculus sp.) is represented by one seed from each of two features. These represent the only seeds of this taxon recovered at the site.

Plant macrofossils were recovered from three of the four pit features analyzed for Component VI, a Late Prehistoric component with an age of 1170 years ago. Feature 30, the large stratified basin, contained by far the largest number and most variety of seeds for this component. Of the 2237 seeds from this feature, 2190 are goosefoot, and the remaining are distributed among saltbush, greasewood, Cruciferae, beeweed, globemallow (Sphaeralcea coccinea), poverty sumpweed, sedge, Gramineae, and unknown taxa. The single globemallow seed is the only one of this taxon recovered at the site. Feature

Table 1. Distribution of charred plant macrofossils recovered from the Taliaferro site.

Feature No.	Feature Type	A.S.S. No.	Volume (liter)	*Atriplex* sp.	*Chenopodium* sp.	*Monolepis nuttalliana*	*Sarcobatus vermicalatus*	*Ranunculus* sp.	Cruciferae	*Cleome* sp.	*Frageria* sp.	*Potentilla* sp.	*Sphaeralcea* sp.	*Mentha* sp.	*Artemisia* sp.	*Helianthus* sp.	*Iva axillaxis*	*Carex* sp.	*Oryzopsis hymenoides*	Gramineae	Liliaceae	Unknown	Total
									Component I														
19	Small Basin	519	10.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
25	Small Basin	539, 540	7.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
									Component II														
13	Medium Basin	515, 516	10.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
21	Medium Basin	534, 535	7.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
									Component III														
20	Medium Basin	524	12.5	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
28	Rock-filled Basin	410	2.5	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2
35	Irregular-shaped	-	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
36	Irregular-shaped	683	2.5	-	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29
37	Rock-filled Basin	684, 689	5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0

Table 1. Continued.

Feature No.	Feature Type	A.S.S. No.	Volume (liter)	*Atriplex* sp.	*Chenopodium* sp.	*Monolepis nuttalliana*	*Sarcobatus vermicalatus*	*Ranunculus* sp.	Cruciferae	*Cleome* sp.	*Fragaria* sp.	*Potentilla* sp.	*Sphaeralcea* sp.	*Mentha* sp.	*Artemisia* sp.	*Helianthus* sp.	*Iva axillaxis*	*Carex* sp.	*Oryzopsis hymenoides*	Gramineae	Liliaceae	Unknown	Total
									Component III (continued)														
38	Rock-filled Basin	758	5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
									Component IV														
5	Small Basin	114	2.5	3	8	1	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	14
6	Oxidized Basin	135	2.5	-	1	1	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	4
7	Large Basin	127	2.5	7	5	3	-	-	-	3	-	-	-	-	-	1	-	3	-	-	-	-	22
15	Oxidized Basin	224, 229	5.0	56	892	-	26	-	121	-	-	-	-	3	-	5	-	33	-	-	-	-	1136
16	Large Basin	233, 234, 235, 236	8.5	12	115	4	-	-	17	4	-	-	-	-	-	5	-	2	-	1	-	3	163
17	Medium Basin	240	2.5	37	164	-	-	-	49	-	-	-	-	-	-	-	-	6	-	-	-	2	258
18	Small Basin	242	2.5	9	49	-	3	-	13	1	-	-	-	-	-	-	-	3	-	-	-	1	79
26	Medium Basin	393, 394,	7.5	6	60	-	-	-	5	155	-	-	-	-	-	-	1	2	-	-	-	-	229
27	Irregular-shaped	401	2.5	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5

C.5

Table 1. Continued.

Feature No.	Feature Type	A.S.S. No.	Volume (liters)	*Atriplex* sp.	*Chenopodium* sp.	*Monolepis nuttalliana*	*Sarcobatus vermicalatus*	*Ranunculus* sp.	Cruciferae	*Cleome* sp.	*Frageria* sp.	*Potentilla* sp.	*Sphaeralcea* sp.	*Mentha* sp.	*Artemisia* sp.	*Helianthus* sp.	*Iva axillaxis*	*Carex* sp.	*Oryzopsis hymenoides*	Gramineae	Liliaceae	Unknown	Total
									Component V														
9	Bell-shaped	125, 126, 134, 146	10.0	5	42	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	3	52
10	Small Basin	144, 145	5.0	-	4	-	-	-	2	-	-	-	-	-	-	2	-	-	-	3	1	-	12
12	Bell-shaped	171, 172	10.0	-	55	-	-	-	1	-	-	-	-	-	-	-	-	-	7	-	-	-	63
14	Rock-filled Basin	209, 210,	12.5	-	36	3	-	-	-	72	-	-	-	-	-	1	-	1	-	-	4	2	119
24	Irregular-shaped	323	2.5	-	14	-	-	1	1	1	-	-	-	-	-	-	-	1	-	-	-	3	21
									Component VI														
29	Small Basin	456	2.5	-	2	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	3
30	Stratified Basin	452, 453, 454, 451, 455, 469, 470, 471	22.5	1	2190	-	3	-	15	16	-	-	1	-	-	-	1	6	-	1	-	3	2237
33	Small Basin	460	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
34	Large Basin	631, 632, 633	5.5	1	152	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	156

Table 1. Concluded.

Feature No.	Feature Type	A.S.S. No.	Volume (liters)	*Atriplex* sp.	*Chenopodium* sp.	*Monolepis nuttalliana*	*Sarcobatus vermicalatus*	*Ranunculus* sp.	Cruciferae	*Cleome* sp.	*Frageria* sp.	*Potentilla* sp.	*Sphaeralcea* sp.	*Mentha* sp.	*Artemisia* sp.	*Helianthus* sp.	*Iva axillaxis*	*Carex* sp.	*Oryzopsis hymenoides*	Gramineae	Liliaceae	Unknown	Total
									Component VII														
1	Irregular-shaped	63	1.5	1	8	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	11
2	Irregular-shaped	73, 74, 75	7.5	1	24	-	-	-	-	-	-	1	-	-	1	-	-	-	2	-	2	-	31
22	Rock-filled Basin	311	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Total				139	3859	13	32	2	225	254	2	1	1	3	1	14	2	59	10	6	7	20	4650

29, a small basin, had only two goosefoot and one beeweed seed; and Feature 34, a large basin, contained mostly goosefoot seeds.

The final Late Prehistoric component yielding charred macrofossils is Component VII dating to 960 years ago. Of the three features examined, only Features 1 and 2, irregular-shaped pits, produced charred seeds. These features had mostly goosefoot. The other taxa, represented by only one or two seeds, include saltbush, monolepis, cinquefoil (Potentilla sp.), sagebrush (Artemisia sp.), sedge, Indian ricegrass, and Liliaceae. This is the only occurrence of cinquefoil and sagebrush seeds at the site.

DESCRIPTION OF TAXA AND ETHNOGRAPHIC USES

The 19 identified taxa from the Taliaferro site are described and their ethnographic uses are discussed below. Except for perhaps strawberry, all of the plants represented in the macrofossil assemblage were observed in the vicinity of the Taliaferro site or probably occurred in the area at the time of occupation. Most are mentioned in the ethnographic or ethnobotanic literature as having been used as food by Indian groups of the Intermountain West. Many are weedy species that invade recently disturbed environments and may have been quite common on the site in the past.

Saltbush

A few saltbush (Atriplex sp.) seeds were recovered from each of the Late Prehistoric Components IV-VII. Component IV yielded the most with seven of the nine pit features containing some. Various species of Atriplex cover wide expanses of the Green River Basin, and among those observed on the ridge top at the Taliaferro site are spiny hopsage (A. spinosa), shadscale (A. confertifolia), and Nutall's saltbush (A. gardneri). Atriplex fruits are enclosed by bracts that, for many species, are difficult to separate. The charred seeds identified from the Taliaferro site may belong to spiny hopsage, a species in which the fruits can be removed from the bracts.

Ethnographically, seeds from several species of Atriplex were gathered by the Indians of Utah, Arizona, and California and ground into flour for bread and mush (Palmer 1878). These seeds, along with those from other taxa in the Chenopodiaceae family, formed one of the most important sources of seed food for the Gosiute Indians of Utah (Chamberlin 1911). Archaeological evidence for the use of saltbush in the Intermountain West comes from seeds found in flotation samples at Sudden Shelter located on the northern Colorado Plateau (Coulam and Barnett 1980). In southwest Wyoming, charred Atriplex seeds were part of the plant macrofossil assemblage from 48CR3495 in the Red Desert (Sender et al. 1982) and 48SW1242 in the Green River Basin (Smith 1986a).

Goosefoot

Except for Feature 25, a small basin dating to the Early Archaic period, charred goosefoot (Chenopodium sp.) seeds were present in every other feature examined that yielded plant macrofossils. It is by far the most common taxon at the Taliaferro site. Features yielding these seeds belong to the Late Archaic Component III through the Late Prehistoric Components IV-VII. Goosefoot is a weedy annual which invades disturbed areas, culitivated places, and waste areas and can produce up to 100,000 seeds per plant (Herron 1952). Because the seeds from the Taliaferro site are horizontal and many of the unruptured specimens retain the distinctive reticulate pericarp, they can be placed in the section Chenopodia subsection Cellulata of the genus Chenopodium (Aellen and Just 1943; Wahl 1954). Based on geographical location of the site and size range of the seeds, they are most likely of the species C. berlandieri, the most abundant and widespread species in western North America. At present, C. berlandieri grows on the playa adjacent to the Taliaferro site.

Chenopodium was an important food plant throughout North America during prehistoric times as attested by their common occurrence in archaeological assemblages. For example, seeds belonging to the Chenopodiaceae and Amaranthaceae families dominate the plant macrofossil collection from Sudden Shelter located on the northern Colorado Plateau (Coulam and Barnett 1980). Goosefoot seeds also are present in prehistoric coprolities from sites such as Hogup Cave and Danger Cave in the eastern Great Basin (Fry 1976). Evidence for their use on the Northern Plains comes from the Ross site in Alberta where a large cache of these seeds was found (Johnston 1962). In southwest Wyoming, Chenopodium is the most common taxon at sites that contain charred seeds (Schroedl 1985).

Additionally, C. berlandieri and C. bushianum, two very similar species which some authors combine into one (cf. Asch and Asch 1985), appear to have been domesticated in some areas of the Southeast and Midwest by as early as 4000 years ago (Cowan 1985). Evidence for domestication is based on morphological differences in the thickness of the outer seed coat of seeds from archaeological sites compared to those of modern wild and domesticated species (Asch and Asch 1985; Smith 1984).

The use of goosefoot seeds by historic Indian groups throughout the Intermountain West is noted in numerous ethnobotanic and ethnographic reports (Yanovsky 1936). Palmer (1871) mentions that many tribes in New Mexico, Arizona, California, and Utah gathered the seeds in large numbers, which were then ground into flour for bread and mush. Goosefoot seeds are among the specimens collected by J. W. Powell from the Kaivavits of northern Arizona in 1872 (Bye 1972). In the Ethno-botany of the Gosiute Indians of Utah, Chamberlin (1911) notes that seeds from members of the Chenopodiaceae family formed a chief source of food. They also were important to the Nevada Shoshoni (Steward 1938). According to Blankinship (1905), the wide distribution and abundance of goosefoot in Montana is the result, in part, of Indians gathering the seeds for food. In addition to using the seeds, young plants and leaves were boiled as "greens" alone or with other food.

Monolepis

Monolepis (Monolepis nuttalliana) seeds were recovered in small quantities from features belonging to the Late Prehistoric Components IV, V, and VII. Four features from Component IV contained at least one monolepis seed, and they were present in one feature from each of the other two components. Monolepis is a low-branching annual that is found in disturbed, alkaline, or dry soils (Alley and Lee 1969). Along with Atriplex and Chenopodium, it is a member of the Chenopodiaceae family.

In the ethnobotanic literature, Chamberlin (1911) notes that Monolepis seeds were used as food by the Gosiute Indians of Utah. The Pima Indians of Arizona would boil the seeds and then partially dry, parch, grind, and eat them as pinole (Russell 1908). The roots also were used as food by the Pima Indians. Archaeologically, charred monolepis seeds are part of the plant macrofossil collections from 48SW1091 (O'Brien et al. 1982) and 48SW1242 (Smith 1986a), both located in the Wyoming Basin, southwest Wyoming.

Greasewood

Charred greasewood (Sarcobatus vermiculatus) seeds were recovered from two features of Component IV and one feature of Component VI. Greasewood is an erect, spiny-branched shrub that grows in alkaline soils where flood waters collect or where there is a high water table at least part of the year. At present, Sarcobatus occurs in fairly pure stands on the alluvial clays of the floodplain below the ridge containing the Taliaferro site. Ethnographically, Indians of the western states ate and prepared greasewood seeds in the same manner as those of other taxa in the Chenopodianceae family (Palmer 1878). According to Blankinship (1905), the young twigs of this plant were used as "greens."

Buttercup

Two charred buttercup (Ranunculus sp.) seeds were identified from the Taliaferro site; one each from two features belonging to the Late Prehistoric Component V. Buttercups are a succulent plant that flowers early in the spring while the ground is still wet from melting snow. Though not observed in the vicinity of the Taliaferro site, sagebrush buttercup (R. glaberrinus) is common in the sagebrush areas throughout the Green River Basin. In the ethnobotanic literature, Chesnut (1902) mentions that the Indians of Mendocino County, California, gathered buttercup seeds in great quantities in May and used them alone or with other seeds for pinole. The Gosiute Indians of Utah would at times eat the entire plant after boiling (Chamberlin 1911). Archaeological evidence for its use in the Intermountain West comes from charred seeds found in flotation samples from Sudden Shelter located on the northern Colorado Plateau (Coulam and Barnett 1980).

Cruciferae

Seeds of the mustard (Cruciferae) family were recovered from the Late Archaic Component III and the Late Prehistoric Components IV-VI. They are most common in Component IV where five of nine features yielded small numbers. These seeds may belong to flaxleaf hedge mustard (Schoenocrambe linifolia), a forb observed on the ridge top at the Taliaferro site in the late spring and early summer. They also may be from a peppergrass (Lepidium sp.), another common member of the Cruciferae family in the Green River Basin.

Many ethnobotanic and ethnographic reports mention the use of seeds from these species, as well as others, by Indian groups of the western United States (Yanovsky 1936). The seeds from Lepidium spp. and Schoenocrambe spp. (listed as Sisymbrium spp.) were ground with other seeds to impart flavor in bread and mush (Palmer 1878). They also were often used unmixed in soups. For the Gosiute Indains of Utah, the most important Cruciferae furnishing edible seeds was hedge mustard (Schoenocrambe or Sisymbrium spp.); however, several taxa in this family were lumped under the same Gosiute name (Chamberlin 1911).

Seeds belonging to the Cruciferae family are common in plant macrofossil assemblages from archaeological sites. Cowboy Cave (Barnett and Coulam 1980) and Sudden Shelter (Coulam and Barnett 1980) on the northern Colorado Plateau contained peppergrass seeds. They also were recovered from prehistoric coprolites from Utah sites (Fry 1976). In southwest Wyoming, charred Lepidium seeds were found in features from the Austin Wash site, 48UT445 (Schroedl 1985) and 48SU873 (Smith 1986b).

Beeweed

Beeweed (Cleome sp.) seeds were present in features belonging to the Late Prehistoric Components IV, V, and VI. Component IV contained the most with five of the nine features having some. Cleome was the dominant taxon in Feature 26, a medium basin. Beeweed is an annual plant with stems up to a meter tall. It flowers in July and August and grows in waste places or open, sandy areas. Though not observed in the vicinity of the Taliaferro site, it occurs throughout southwest Wyoming.

Ethnographically, in the Southwest the young shoots, leaves, and flowers of beeweed were commonly used as a potherb (Yanovsky 1936). It is one of the wild plants listed by Whiting (1939) that the Hopi encouraged and allowed to grow and seed in their fields, and its distribution is probably the result of human manipulation. The plant has a distinctive, unpleasant odor, which disappears with cooking (Standley 1912). The seeds also are gathered and eaten (Castetter 1935; Elmore 1944). Archaeological evidence of its use in southwest Wyoming comes from charred seeds recovered in flotation samples of feature fill at 48CR3495 in the Red Desert (Sender et al. 1982).

Strawberry

Two charred strawberry (Frageria sp.) seeds were recovered from Feature 6, an oxidized basin belonging to the Late Prehistoric Component IV. This low plant usually grows in forest clearings and open areas in the mountains, blooms in May, and the fruit ripens in early summer. Strawberries probably did not grow in the vicinity of the Taliaferro site, but they could have been obtained in the nearby mountains.

Strawberries were considered a delicacy by ethnographic groups throughout North America (Palmer 1871). They were collected and used in season, but usually the fruit was too juicy to be successfully dried for winter use (Chamberlin 1911; Gilmore 1919) though some Indian groups boiled them down into jam (Yanovsky 1936). Archaeologically, strawberry seeds are part of the plant macrofossil collection from Sudden Shelter on the northern Colorado Plateau (Coulam and Barnett 1980). After goosefoot, strawberry was the most common taxon represented by charred seeds recovered from features at the Austin Wash site and at 48UT779 in the Green River Basin (Schroedl 1985).

Cinquefoil

A single charred cinquefoil (Potentialla sp.) seed was found in Feature 2, an irregular-shaped pit in the Late Prehistoric Component VII. At present, silverweed cinquefoil (P. anserina) occurs in the narrow riparian community along Slate Creek in the vicinity of the Taliaferro site. It grows in wet, saline soil; has long, creeping stolens; and blooms from April to October. Cinquefoil roots were often used as food by the native peoples of Montana and British Columbia, and they taste like sweetpotatoes (Blankinship 1905; Teit 1930).

Globemallow

One globemallow (*Sphaeralcea* sp.) seed was part of the extensive plant macrofossil assemblage from Feature 30, the large, stratified basin in the Late Prehistoric Component VI. Throughout the area, globemallow grows in disturbed areas and on dry hillsides in association with sagebrush, and blooms from May to September. Though Whiting (1939) notes that its root was chewed or boiled by the Hopi for treatment of or remedy for broken bones, it does not appear to have been used as a food plant.

Mint

Three charred mint (*Mentha* sp.) seeds were recovered from Feature 15, an oxidized basin belonging to the Late Prehistoric Component IV. The seeds may be from field mint (*M. arvensis*), which is present in the narrow riparian community along Slate Creek in the vicinity of the Taliaferro site. It is an aromatic, perennial herb that grows from rhizomes and flowers from July to September. Ethnographically, the leaves of this plant were used to make a tea-like beverage (Chamberlin 1911; Yanovsky 1936).

Sagebrush

A single sagebrush (*Artemisia* sp.) seed came from Feature 2, an irregular-shaped pit in the Late Prehistoric Component VII. Big sagebrush (*A. tridentata*) occurs within the area of the Taliaferro site and covers wide expanses of the Green River Basin. The seeds of some species of *Artemisia* were gathered and ground into a mush by Indian groups of the Intermountain West (Chamberlin 1911; Palmer 1878); however, some groups used them only as an emergency food because of their bitter taste (Steward 1933). The leaves were made into a strong tea, which was used for headaches, colds, and worms. In treeless areas, sagebrush also provided fuel. Archaeologically, *Artemisia* seeds were part of the plant macrofossil assemblage from Sudden Shelter on the northern Colorado Plateau (Coulam and Barnett 1980).

Sunflower

Sunflower (*Helianthus* sp.) seeds, actually achenes, were present in features from the Late Prehistoric Components IV and V. They occur in three features from Component IV and two features in Component V. The most abundant wild species is the common sunflower (*H. annuus*) which grows throughout the western United States in a variety of habitats including waste areas, open fields, and disturbed soils. It blooms from July to September. Though not observed in the vicinity of the Taliaferro site, at present it grows along some of the roadsides of the area.

Many Indian groups throughout the western United States extensively gathered the achenes of wild sunflowers for food (Heiser 1951). The Gosiute prized the seeds highly as a source of food and oil (Chamberlin 1911). Using paddles, the ripe seeds were beaten out of the heads into baskets. The seeds were then parched and ground into a meal or flour; made into thin, gray cakes; and baked in hot ashes (Palmer 1878). During the Lewis and Clark expedition, Gass (1807) noted that the Shoshoni of Idaho and Wyoming would make bread from sunflowers and goosefoot seeds mixed with berries and wild cherries. The sunflower was also used widely medicinally and in ceremonies (Heiser 1951).

In addition to its wild form in the western United States, the sunflower was cultivated and domesticated during prehistoric times in the eastern United States (Heiser 1985). Heiser believes that the common sunflower moved from the West to the East as a weedy "camp follower" and then was developed into domesticated forms. Because sunflowers are a weedy, pioneer species, which does best in recently disturbed habitats, its distribution in the West may have been the result of human activities and encouragement. Blankinship (1905) states that its wide extent throughout Montana was probably largely due to the Indians.

Archaeological evidence for its use in the Intermountain West comes from achenes found in flotation samples from Sudden Shelter on the northern Colorado Plateau (Coulam and Barnett 1980). In southwest Wyoming, charred achenes were recovered from a feature at 48UT779 (Schroedl 1985).

Poverty Sumpweed

Two charred sumpweed (*Iva axillaris*) seeds were found in features at the Taliaferro site: one was from Feature 26, a medium basin in the Late Prehistoric Component V, and the other came from Feature 30, the large, stratified basin in the Late Prehistoric Component VI. Poverty sumpweed is a branched perennial up to 45 cm in height that flowers from May to September. It usually grows in disturbed and waste areas and is quite tolerant of alkaline soils. It was not observed in the vicinity of the Taliaferro site, but it probably occurs in habitats like those of goosefoot and sunflower. Though no ethnographic or ethnobotanic reports mention the use of sumpweed seeds by Indian groups of the western United States, seeds from a similar species (*I. annua*) were an important food to the prehistoric inhabitants of the eastern United States (Asch and Asch 1978; Yarnell 1978). During prehistoric times in the eastern United States, the plant was cultivated and domesticated, which increased the achene size. Sumpweed is considered, along with sunflower, to be part of the Eastern Agricultural complex (Cowan 1985). Like sunflower, *I. axillaris* is a "camp follower," and the activities of prehistoric people probably influcened its distribution in the West.

Sedge

Sedge (*Carex* sp.) seeds occurred in features belonging to the Early Archaic Component I and each of the four Late Prehistoric components. A single seed was recovered from Component I while they were most common in the Late Prehistoric Component IV occurring in six of the nine features. The seeds may be from Nebraska sedge (*C. nebraskensis*), a species observed in the riparian community along Slate Creek in the vicinity of the Taliaferro site. This sedge grows in moist to wet places, often in alkaline soils, and flowers from May to August. Ethnographically the leaves of some species were woven into mats, and the succulent, young stems were used as food (Blankenship 1905; Chamberlin 1911; Coville 1897). Charred sedge seeds were found in features from archaeological sites such as Cowboy Cave (Barnett and Coulam 1980) and Sudden Shelter (Coulam and Barnett 1980) on the northern Colorado Plateau.

Indian Ricegrass

Charred Indian ricegrass (*Oryzopsis hymenoides*) seeds are part of the plant macrofossil assemblages from the Late Prehistoric Components IV, V, and VII. Indian ricegrass occurs on the fairly dry, open ridge top of the

Taliaferro site in association with spiny hopsage, sagebrush, and spiny horsebrush. It flowers from May to July. Indian groups throughout the western United States would gather large quantities of these seeds, which were then parched in trays with hot coals and ground into flour for mush or bread (Chamberlin 1911; Palmer 1871). Steward (1938) notes that the quantities collected were limited due to the short harvest season of only a few weeks. Indian ricegrass seeds were recovered from archaeological sites such as Sudden Shelter (Coulam and Barnett 1980) and from prehistoric coprolites (Fry 1976). They also were present in features from 48UT445 (Schroedl 1985), 48SW2429 (Nelson 1982), 48CR3472, and 48CR3495 (Sender et al. 1982) in southwest Wyoming.

Gramineae

Unidentifiable grass (Gramineae) seeds were recovered in small quantities from the Late Prehistoric Components IV, V, and VI. These seeds may be from dropseed (Sporobolus sp.), a common grass in alkaline to slightly saline, sandy soil. This grass flowers from June through September. The seeds of this grass were an important food for the Indians of the Intermountain West (Palmer 1878). They were first parched and then ground into flour for bread or mush. Archaeologically, Sporobolus seeds have been identified from Sudden Shelter on the northern Colorado Plateau (Coulam and Barnett 1980).

Liliaceae

A few seeds identified to the lily (Liliaceae) family were found in features belonging to the Late Prehistoric Components V and VII. Though no members of the lily family were observed in the vicinity of the Taliaferro site, onions (Allium sp.) are among those that occur in the area. The bulbs of onions, as well as many other taxa in this family, were collected and eaten in the spring and early summer by Indian groups throughout North America (Yanovsky 1936). Chamberlin (1911) states that onions were not preserved for later use.

Unknown

Unidentifiable charred seeds (n=20) were recovered from the Late Prehistoric Components IV, V, and VI. They are morphologically different from the preceding taxa.

TYPE AND SEASON OF ACTIVITIES REPRESENTED

The prehistoric inhabitants at the Taliaferro site engaged in the collection and processing of a wide variety of seed foods, at least during the Late Prehistoric period. This is evidenced by the recovery of thousands of charred seeds representing 19 distinct taxa. As shown in the description for each taxon, most provided seeds that were a major source of food for the ethnographic groups of the Intermountain West. This is especially true of the weedy species. The prehistoric inhabitants gathered seeds in great numbers and pounded them into flour for bread and mush (Chamberlin 1911; Lowie 1909; Palmer 1871, 1878).

Most of the taxa identified from the charred seeds were observed among the four vegetation types recorded in the area of the Taliaferro site. The various topographic features in the immediate site vicinity delineate the vegetation types. These include the interfluvial ridge tops, floodplains of the ephemeral drainage to the south of the site and Slate Creek, the playa, and the riparian community along Slate Creek. Each of these vegetation communities contain different food plants important to the Indians and are usually found in only widely scattered patches in the Green River Basin. Other taxa represented in the plant macrofossil assemblage, but not presently occurring in the site area, probably grew in the disturbed deposits at the time of prehistoric occupation.

Ethnographic descriptions of seed gathering and processing techniques provide clues to the methods employed at the Taliaferro site during prehistoric times. These accounts usually mention that women gathered seeds of various species into large conical baskets. The gathered material was carried to the encampment and piled upon the ground for processing. The seeds were separated from the chaff and other waste parts by threshing and winnowing. Threshing was accomplished by placing the seeds on the ground and beating them with sticks or paddles. The threshed material was thrown into the air, allowing the wind to blow away the lighter, unwanted parts while the seeds fell onto a skin. Next, often the seeds were parched with hot coals in basket trays and ground on a metate (Chamberlin 1911). These methods of preparing seeds for use were fairly uniform thoughout the Great Basin and Plateau areas during ethnographic times (Steward 1938).

During his explorations of the Colorado River in the late 1860s and early 1870s, Powell observed the Kaibab Paiute of northern Arizona and southern Utah collecting and processing seeds of several species. He gives this interesting and poetic description:

> For this purpose, they have large conical baskets, which hold two or more bushels. The women carry them on their backs, suspended from their foreheads by broad straps, and with a smaller one in the left hand, and willow woven fan in the right, they walk among the grasses, and sweep the seed into the smaller basket, which is emptied, now and then, into the larger, until it is full of seeds and chaff; then they winnow out the chaff and roast the seeds. They roast these curiously; they put the seeds, with a quantity of red hot coals, into a willow tray, and, by rapidly and dexterously shaking and tossing them, keep the coals aglow, and the seeds and tray from burning. As if by magic, so skilled are the crones in this work, they roll the seeds to one side of the tray, as they are roasted, and the coals to the other. Then they grind the seeds into a fine flour, and make it into cakes and mush. It is a merry sight, sometimes, to see the women grinding at the mill. For a mill, they use a large flat rock, lying on the ground, and another small cylindrical one in their hands. They sit prone on the ground, hold the large flat rock between the feet and legs, then fill their laps with seeds, making a hopper to the mill with their dusky legs, and grind by pushing the seeds across the larger rock, where it drops into a tray. I have seen a group of women grinding together, keeping time to a chant, or gossiping and chatting, while the younger lassies would jest and chatter, and make the pine woods merry with their laughter [Powell 1875:126-127].

The Indians of the Intermountain West prepared the ground flour as mush or bread (Chamberlin 1911; Palmer 1871, 1878). To make the mush, the seed meal was mixed with water and boiled in a basket using hot rocks (Kelly 1932). The stones were heated in a fire and then added to the contents of the basket "producing a mess mixed with soot, ashes, and dirt" (Wyeth 1851:211). The ground substance was also baked in hot ashes to produce a bread. As noted by Palmer, flour made from the gray goosefoot seeds "imparts to the bread a very dirty look, and when baked in ashes it is not improved in appearance" (1871:419). Cakes made from ground goosefoot and sunflower seeds mixed with hawthorns, chokecherries, and serviceberries were dried in the sun for food (Gass 1807; Palmer 1871; Wyeth 1851).

As indicated by the above ethnographic descriptions, the collecting and processing of seeds precludes the direct use of fire hearths. Instead, hearths were used for obtaining coals for parching or for baking bread in the hot ashes. Charred seeds, however, could be accidentally incorporated into these features during any stage of the processing, especially because the seeds often were left in piles about their camps. This is noted by several of the early explorers of the Intermountain West when they came upon Indian encampments. While exploring on the western side of Promontory Point, Utah, in October 1849, Stansbury "came to a blackish spring, where there had been a camp of Indians the night before. . . .A quantity of some species of seeds they had been beating out lay in small heaps around" (1852:103). Fremont, while traveling up the Bear River in September 1843, also found "a small encampment of two families of Snake Indians. . . . They had piles of seeds, of three different kinds, spread out upon pieces of buffalo robe" (1845:159).

These historic accounts also indicate that seeds from several species were processed together, which is consistent with the plant macrofossil assemblage from the Taliaferro site where several different taxa were recovered from the same feature. Ethnographically, several kinds of seeds were mixed and ground together and made into cakes (Palmer 1871). The Shoshoni mixed sunflower seeds with those of goosefoot and others as noted by Gass (1807:125, 128) during the Lewis and Clark expedition. The seeds of the Cruciferae family were ground with others to impart flavor for the bread or mush (Palmer 1878).

In addition to the processing of seeds, some of the recovered plant macrofossils may have become incorporated into the features due to the natural prehistoric seed rain or by the indirect use of the plant containing the seed (Minnis 1981). Plants growing on the site at the time of occupation could have produced seeds that were accidentally charred and preserved in the features. This is especially true for taxa such as globemallow that are represented by only one or two recovered seeds and lack known ethnographic uses as food. The single sagebrush seed found during this analysis could have been introduced into the archaeologcial record as a result of using its wood for fuel. Greenhouse et al. (1981) encountered this problem in the interpretation of the charred plant macrofossil record during their analysis of flotation samples from a modern cholla roasting pit in Arizona. They found charred sweepweed (Suaeda torreyana) seeds in the samples. They felt these were due to the use of the plant to cover the buds while roasting or were the result of the seeds being in the soil near the pit.

Some of the plant macrofossils may be present in the pit features due to storage activities. Indian groups of the western United States would collect, winnow, and store large quantities of seeds for winter use (Chamberlin 1911; Steward 1938). The seeds were placed in baskets that were stored in covered pits. The seed caches were located as near as possible to winter villages. These storage activities need to be considered when making interpretations on the season of site occupation based on the phenology of the plants represented by the recovered macrofossils.

Because numerous charred seeds were found in most features at the Taliaferro site, they most likely were the result of the gathering and processing of ripe seeds by the prehistoric inhabitants. Most of the seeds recovered during this analysis would have been available in the late summer and early fall. Lowie (1924) reports that the Shoshoni would gather several kinds of seeds during the fall for winter stores. The collection of seeds during the fall by the ethnographic groups is also reported by early explorers. While traveling though the valley of Ogden Creek in late August 1849, Stansbury came upon a group of eight or ten Indian women and girls "each with a basket on her back, gathering grass-seeds for their winter's provision. They were of the class of 'root diggers,' or as the guides called them, 'snake diggers' (1852:82). As mentioned above, Fremont (1845:159) and Stansbury (1852:103) observed in September and October Indian camps with piles of seeds that apparently were being threshed and winnowed. A few of the recovered charred seeds were identified to taxa (such as buttercup and lily) that bloom in the spring and early summer, which indicates that the site may have been occupied as early as June.

COMPARISONS WITH OTHER MACROFOSSIL ASSEMBLAGES

Over the past few years, plant macrofossil analyses of fill from many feature types representing most temporal periods in southwest Wyoming have begun to yield enough data for comparisons. Though the relative importance of each taxon in the diet of prehistoric peoples cannot be assessed from the actual number of seeds of each type recovered, comparisons can provide at least some clues to the kinds of seeds used. Table 2 lists the charred seeds recovered from selected sites in the Wyoming Basin of southwest Wyoming. It also includes the ages for the components that contained the seeds.

As is clearly shown in Table 2, except for a few cases, most of the plant macrofossil assemblages in southwest Wyoming belong to the Late Prehistoric period dating between 1650 and 750 years ago. This is consistent with the results of the plant macrofossil analysis for the Taliaferro site where most of the seeds came from one of the Late Prehistoric components. Besides those recovered from the Late Prehistoric components, only a single charred seed was recovered from the Early Archaic Component I and 34 seeds were recovered from the Late Archaic Component III from three features. The paucity of charred plant macrofossils from the Archaic periods in southwest Wyoming is probably not a function of preservation because most features from the period are still relatively intact with charcoal occurring in most. Though the sample of Archaic period features with plant macrofossils will most likely increase with further research, there appears to be a marked change in plant utilization patterns of the prehistoric peoples to a greater reliance on seed foods by the Late Prehistoric period.

Overwhelmingly, goosefoot (Chenopodium sp.) is the dominant taxon represented at sites containing plant macrofossils in southwest Wyoming. Goosefoot is a weedy annual which invades waste places and probably grew in the disturbed areas of most sites at the time of occupation. It is also present on the playa in the vicinity of the Taliaferro site. Among the other weedy species identified from plant macrofossil collections are beeweed (Cleome sp.), sunflower (Helianthus sp.), monolepis (Monolepis nuttalliana), and some from the mustard (Cruciferae) family. These taxa are quite common in

Table 2. Charred seeds recovered from selected sites in the Wyoming Basin, southwest Wyoming.

Site	Age (Years B.P.)	No. of Features with seeds	Seeds Found	Reference
48UT390	1070-1370	7	65 Chenopodium	Schroedl 1985
			70 Frageria	
			15 Lepidium	
48UT199	1260-1460	2	2 Chenopodium	Schroedl 1985
48UT779	1130	6	410 Chenopodium	Schroedl 1985
			39 Frageria	
			2 Helianthus	
			10 Salix	
48UT445	930-1200	1	24 Chenopodium	Schroedl 1985
			1 Oryzopis hymenoides	
			1 Lepidium	
			9 Salix	
48CR3472	1100-1370	3	16 Chenopodium	Sender et al. 1982
			1 Oryzopsis hymenoides	
48CR3495	790-1650	9	1037 Chenopodium	Sender et al. 1982
			8 Oryzopsis hymenoides	
			31 Atriplex	
			7 Cleome	
			122 Cruciferae	
			1 Atragalus	
			2 Opuntia polycantha	
			1 Leguminosae	
			1 Compositae	
48CR2200	1650	1	1 unidentifiable	Scott 1983
	ca. 5000	1	4 Chenopodium	
48SW1091	3920	1	1 Monolepis nuttalliana	O'Brian et al. 1982
	1150-1340	4	10 Chenopodium	
			2 Monolepis nuttalliana	

Table 2. Concluded.

Site	Age (Years B.P.)	No. of Features with seeds	Seeds Found	Reference
48SW4381	1390	1	1 Gramineae 2 cf. Chenopodium	Scott 1982
48SW1242	1550	5	7 Chenopodium 73 Monolepis 8 Atriplex	Smith 1986a
48SU873	1310	2	9 Chenopodium 1 Lepidium	Smith 1986b
48SW2590	6000-6480	4	54 Prunus virginiana fragments 1 Juniperos scopulorum fragment	Smith 1986c
	4800	2	6 Prunus virginiana fragments 1 Astragelus	
	1140	2	1 Rosa 1 Juniperus scopulorum fragments	

features at the Taliaferro site as well as other sites in southwest Wyoming. Grass seeds, including Indian ricegrass (Oryzopsis hymenoides), are an important component of these assemblages. All the above listed taxa were important in the diet of the ethnographic groups of the western United States.

The seeds from these taxa are available in the late summer and fall, around August and September, which corresponds to the time of year noted in the ethnographic and historic reports of when seeds were gathered for winter stores. This suggests that some sites in the Wyoming Basin, especially at localities like the Taliaferro site, were inhabited during the late summer for the procurement of seeds for the winter. In marked contrast, the Maxon Ranch site (48SW2590), located in the Rock Springs Uplift, a foothills area of the Wyoming Basin, lacked charred plant remains from weedy species and contained mostly charred chokecherry (Prunus virginiana) seeds (Smith 1986c). The chokecherry seeds may represent the winter or spring consumption of dried fruits. Faunal evidence (winter/early spring) from the Maxon Ranch site demonstrates that it was occupied during periods of the year (Harrell and McKern 1986) other than late summer when sites in the lower basins were in use. Because most of the plant remains at the Maxon Ranch site were recovered from features belonging to components earlier than the Late Prehistoric period, the differences in plant utilization may also be the result of changes in subsistence practices between the Archaic and later periods.

HUMAN INFLUENCE ON PLANT DISTRIBUTIONS

Most of the seeds commonly recovered from sites in the Wyoming Basin are of weedy species that thrive in recently disturbed areas. They are tolerant of a broad range of habitat when there is little competition from other plants. Once ecological succession develops beyond the pioneer stages, they are usually eliminated from the natural vegetation of a locality. Except for goosefoot which occurs on the disturbed playa surface at the Taliaferro site, presently these species rarely occur as dense stands in the area. Most are seen only along roadways.

To produce stands large and dense enough for profitable exploitation of these food plants in the past, areas had to be regularly reduced back to the first stages of plant succession. Most likely humans acted as the agent, either intentionally or accidentally, for this disturbance. They could have created suitable environments fortuitously during their day-to-day activities at a site, but unless the prehistoric populations were quite large, this probably disturbed only a minor portion of the required area. Other more deliberate means may have been employed to ensure an adequate food supply including burning off the vegetation or the actual sowing of seeds of the desired plants.

In the past, hunters and gatherers throughout North America used fire to revert the vegetation back to the more economically productive pioneer stages which facilitated gathering, hunting, and travel. O. Stewart (1954, 1955a, 1955b), one of the first to promote the idea, mentions numerous examples from the historic and ethnographic literature of Indians intentionally setting fires for their economic benefit. Some of the vegetation patterns observed by the early explorers and first settlers were probably the result of this extensive practice. Indian-caused fires are noted often in journals of the early explorers. For example, Fremont, while traveling near the Bear River in 1843, notes, "On the creek were fringes of young willows, older trees being rarely found on the plains, where the Indians burn the surface to produce better grass" (1845:146). In another entry for the Snake River area, Fremont reports that "This is the fall or second growth, the dried grass having been burnt off by the Indians; and wherever the fire has passed, the bright-green color is universal" (1845:171).

In the ethnographic literature, Steward (1941) remarks that the burning of brush to facilitate growth of wild seed plants was a common practice among the Nevada Shoshoni. Many of the Indian groups would burn the vegetation in the fall to promote goosefoot, Indian ricegrass, and certain species of *Atriplex*. In Utah and Nevada, the Indians frequently burned off the sagebrush to maintain small grassy prairies (Stewart 1955b).

Besides vegetation burning, the seeds of certain wild species may actually have been broadcast around campsites to provide a known food supply for the next season. Steward (1938, 1941) mentions that many ethnographic groups in the Great Basin would burn brush in the fall and then sow seeds of such wild plants as goosefoot, Indian ricegrass, and mentzelia (*Mentzelia* sp.). Bye (1979) has observed the Tarahumara Indians of western Mexico sowing the seeds and caring for a wild mustard (*Brassica campestris*) and a pepper-grass (*Lepidium virginicum*), both members of the Cruciferae family. Beeweed was allowed to mature and to disperse its seed in Hopi fields (Whiting 1939).

Additionally, several weedy species, including goosefoot and sunflower, were domesticated by as early as 4000 years ago in areas of the Midwest and Southeast (Cowan 1985). Charred sunflower seeds from archaeological sites in these regions are significantly larger than those of wild species (Yarnell 1978). Evidence for the prehistoric domestication of goosefoot is based on changes in the thickness of the outer seed coat (Asch and Asch 1985; Smith 1984).

The dramatic increase of charred seeds of predominately weedy species, such as goosefoot, sunflower, monolepis, beeweed, and mustards, for the Late Prehistoric period in southwest Wyoming that are known to have been domesticated or at least cultivated in some areas further suggests that the prehistoric inhabitants of the Wyoming Basin manipulated and encouraged some of these taxa. As mentioned above, the prehistoric people of southwest Wyoming could have simply created suitable environments for the pioneer weedy species by such means as fire or by allowing desirable plants to grow and disperse their seeds. Generally most hunters and gatherers, while adapting to the environment, have altered it as well, especially in their relationship with plants. Blankinship (1905) notes that in Montana the present extent of many species, including sunflower and goosefoot, is largely due to their use by the Indians as food. Humans also have influcenced the range of many species by unintentionally transporting viable seeds to other regions (Gilmore 1919). The early explorers of the West encountered a "natural" vegetation that was much the result of intentional or accidental human manipulation.

OTHER POSSIBLE PLANT RESOURCES

Besides seeds, the ethnographic groups, and most likely the prehistoric people, of the western United States exploited other portions of plants, including roots, leaves, and stems, for food; however, direct evidence for their use would not be represented in the archaeologcial record. Of the plants providing edible roots, yampa (Perideridia gairdneri) was the most highly prized (Chamberlin 1911). While traveling through Wyoming in August 1843, Fremont noted:

> At this place I became first acquainted with the yampah, (Anethun grareolens,) which I found our Snake women engaged in digging in the low timbered bottom of the creek. Among the Indians along the Rocky Mountains, and more particularly among the Shoshonee or Snake Indians, in whose territory it is very abundant, this is considered the best among the roots used for food [1845:124].

Large quanities of these roots were gathered and cached in pits for winter use (Chamberlin 1911; Steward 1938). Other important root plants included checker lily (Fritillaria atropurpurea), spring beauty (Claytonia megahiza), onions (Allium spp.), and sego lily (Calochortus nuttalli).

These roots usually were roasted in pits lined with hot stones, which were covered and left over night (Chamberlin 1911). According to Smith (1974), the Ute would place the roots in a pit with a layer of heated rocks and damp grass in the bottom. Above the roots, another layer of grass and heated rocks were put in the pit. Finally, the oven was covered with cold rocks and dirt and left 24 hours.

The leaves and stems of many plants were another important food source for the ethnographic groups. Among plants used in this manner are arrowroot

(*Balsamorrhiza sagittata*), biscuitroot (*Cymopterus* spp.), buttercup (*Ranunculus* spp.), goosefoot (*Chenopodium* spp.), and bulrush (*Scirpus* spp.). They were eaten as "greens" after being boiled in water (Chamberlin 1911). The water usually was heated in a basket by adding hot rocks. Evidence for the use of these plants in the archaeological record would be the pits or the rocks. If the plants were in fruit at the time of use, a few seeds may have been accidentally charred and incorporated into features.

APPENDIX D

POLLEN ANALYSIS

BY L. J. Scott

The Taliaferro site is a multi-component site located in the Green River Basin. Pollen samples were collected from this site during archaeological excavations to examine both paleoenvironment and subsistence. Occupation ranges from approximately 5290 to 960 years B.P., with the majority of the occupation falling post-1500 years B.P. Two stratigraphic columns were sampled at the site to provide data for the paleoenvironmental reconstruction. The later occupations (post-2900 years B.P.) are best represented in the longest stratigraphic column, Column 1. A much shorter stratigraphic column, Column 2, was sampled in an area containing deposits from the earlier portion of the Archaic. Numerous features and the living surface around the features were also sampled in an effort to gather subsistence data. Groundstone was plentiful at the site, and several pieces were washed for pollen to provide more direct evidence of subsistence.

METHODS

The pollen was extracted from soil samples submitted by AS-WWC from the Taliaferro site in southwestern Wyoming. A chemical extraction technique based on flotation was the standard preparation technique used for the removal of the pollen from the large volume of sand, silt, and clay with which they were mixed. This particular process was developed for extraction of pollen from soils where preservation has been less than ideal and pollen density is low.

Hydrochloric acid (10%) was used to remove calcium carbonates present in the soil, after which the samples were screened through 150 micron mesh. Zinc bromide (density 2.0) was used for the flotation process. All samples received a short (10 minute) treatment in hot hydrofluoric acid to remove any remaining inorganic particles. The samples were then acetolated for 3 minutes to remove any extraneous organic matter.

A light microscope was used to count the pollen to a total of 100 to 200 pollen grains at a magnification of 430x. Pollen preservation in these samples varied from good to poor. Comparative reference material collected at the Intermountain Herbarium at Utah State University and the University of Colorado Herbarium was used to identify the pollen to the family, genus, and species level where possible.

Pollen aggregates were recorded during identification of the pollen. Aggregates are clumps of a single type of pollen and may be interpreted to represent pollen dispersal over short distances or the actual introduction of portions of the plant represented into an archaeological setting. Aggregates were included in the pollen counts as single grains, as is customary. The presence of aggregates is noted by an "A" next to the pollen frequency on the pollen diagram.

Groundstone was washed with distilled water and dilute hydrochloric acid to recover any pollen from the ground (used) surface. Concentrations of pollen from the ground surfaces may represent plants ground using manos and metates. The ground surfaces had no appreciable quantity of dirt adhering to them. The surfaces were washed with distilled water and dilute hydrochloric acid and scrubbed with a brush to release all trapped pollen. The resulting liquid was saved and processed in a similar manner to the soil samples with the exception that the zinc bromide separation was not used.

DISCUSSION

The Taliaferro site (48LN1468) is a large multi-component campsite located on a ridgetop and slope immediately south of Slate Creek in Lincoln County, Wyoming. Elevation of the site is 1989 m (6525 ft). The site is located within the Green River Basin to the east of the Overthrust Belt. The Upper Sonoran and Transition zones are the two major life zones recorded for the floor of the basin. The Upper Sonoran zone is characterized by mixed desert shrub vegetation with juniper scattered only on occasional ridges. The Transition zone is dominated by sagebrush with occasional juniper or pine observed on the higher ridges and in the foothills. The vegetation on the ridgetop where the Taliaferro site is located falls within the Upper Sonoran vegetation zone. The dominant shrubs are spiny hopsage (Artiplex - a Cheno-am), sagebrush (Artemisia tridentata), and spiny horsebrush (Tetradymia spinosa - a High-spine Composite). Other shrubs recorded include members of the Cheno-am and High-spine Compositae pollen groups (shadscale, summer cypress, and rabbitbrush). Various grasses were observed on the ridge, including Indian ricegrass (Oryzopsis). Numerous forbs were recorded, including vetch (Astragalus), sandverbena (Abronia), mustard (Schoenocrambe), evening primrose (Oenothera), crazyweed (Oxyeropis), and penstemon (Penstemon). Sandier areas of the ridgetop support winterfat and saltbush (both Cheno-ams), and greasewood (Sarcobatus) and pricklypear (Opuntia) occur in the more active areas at the edge of the sand shadow. Vegetation on the plain below the ridge is composed primarily of greasewood, sagebrush, and saltbush. Vegetation recorded in the area of the playa includes bien wormwood (Artemisia biennis), goosefoot (Chenopodium), and spurge (Chamaesyce). Grasses form a narrow band surrounding the playa, where saltbush also grows.

Present-day Slate Creek supports a narrow riparian community containing sedges (Cyperaceae), rush (Juncus), aster (Aster), mint (Mentha), and cinquefoil (Potentilla). Sagebrush (Artemisia), grasses (Gramineae), and reedgrass (Phragmites) were noted at the edge of the riparian community.

The Taliaferro site is located in an area that exhibits a concentration of four distinct vegetation types which, within the Green River Basin, usually occur in widely scattered patches. This concentration would have provided the occupants of the site with direct access to varied floral resources. A full discussion of the vegetation is presented in Chapter 2.

Paleoenvironment

Pollen Column 1 was taken from the south half of Excavation Area A. This stratigraphic column was sampled at 5 cm intervals to provide a more detailed data set for interpretation of the paleoenvironment (Table 1). Radiocarbon dates associated with the stratigraphic column span the time period 2590 to 900 years B.P. The stratigraphic unit sampled is considerably deeper than the area corresponding to the date of 2590 years B.P. The present ground surface is represented by Sample 724, the first sample collected in Pollen Column 1. This sample reflects the presence of Artiplex (saltbush) and Artemisia (sagebrush) on the ridgetop. The pollen record is dominated by Cheno-am pollen (Figure 1, Table 2), indicating that saltbush is contributing most heavily to the pollen record at the present.

For the purpose of discussion, this pollen record is divided into two zones, each of which is considered to have some degree of internal uniformity in relation to vegetation or climatic parameters. Zone A is represented in the pollen record by moderate to moderately high frequencies of Cheno-am

Table 1. Provenience of pollen samples from stratigraphic columns, Taliaferro site.

Sample No.	Depth in cm below in pgs	Stratum	Soil Description	Pollen Counted
Column 1	(2-S/13E)			
724	0-5	5-1	Sand	100
725	5-10	5-2	Sand	100
726	10-15	5-3	Sand	200
727	15-20	5-4	Charcoal stain	200
728	20-25	5-5	Sand	200
729	25-30	5-6	Charcoal stain	200
730	30-35	4-1	Sand	200
731	35-40	4-2	Sand	Insuff
732	40-45	4-3	Sand	200
733	45-50	4-4	Sand	200
734	50-55	4-5	Sand	200
735	55-60	3-1	Charcoal stain, Component VI	Insuff
736	60-65	3-2	Charcoal stain, Component VI	200
737	65-70	3-3	Charcoal stain, Component VI	200
738	70-75	3-4	Charcoal stain, Component VI	200
739	75-80	3-5	Charcoal stain, Component VI	200
740	80-85	3-6	Concentrated charcoal, Component VI	200
741	85-90	3-7	Concentrated charcoal, Component VI	200
742	90-95	2-1	Sand, clay, calcium carbonates	200
743	95-100	2-2	Sand, clay, calcium carbonates	200
744	100-105	2-3	Sand, clay, calcium carbonates, Component III	200
745	105-110	1-1	Sand, clay, calcium carbonates	200
746	110-115	1-2	Sand, clay, calcium carbonates	200
747	115-120	1-3	Sand, clay, calcium carbonates	200
748	120-125	1-4	Sand, clay, calcium carbonates	200
749	125-130	1-5	Sand, clay, calcium carbonates	Insuff
750	130-135	1-6	Sand, clay, calcium carbonates	200
751	135-140	1-7	Sand, clay, calcium carbonates	200
752	140-145	1-8	Sand, clay, calcium carbonates	200
753	145-150	1-9	Sand, clay, calcium carbonates	200
754	150-155	1-10	Sand, clay, calcium carbonates	200
755	155-160	1-11	Sand, clay, calcium carbonates	200
756	160-165	1-12	Sand, clay, calcium carbonates	200
Column 2	(5S/15.4E)			
562	0-5	4-1	Wind blown loose sand	200
564	10-15	4-3	Slightly compact sand	200
566	17-22	4-5	Slightly compact sand, Component II	200
568	27-32	3-2	Sand, high calcium carbonates	200
570	37-40	3-4	Sand, high calcium carbonates	200
572	45-49	2-2	Charcoal stain calcium carbonates, Component I	100
574	54-59	1-2	Sand, calcium carbonates	100

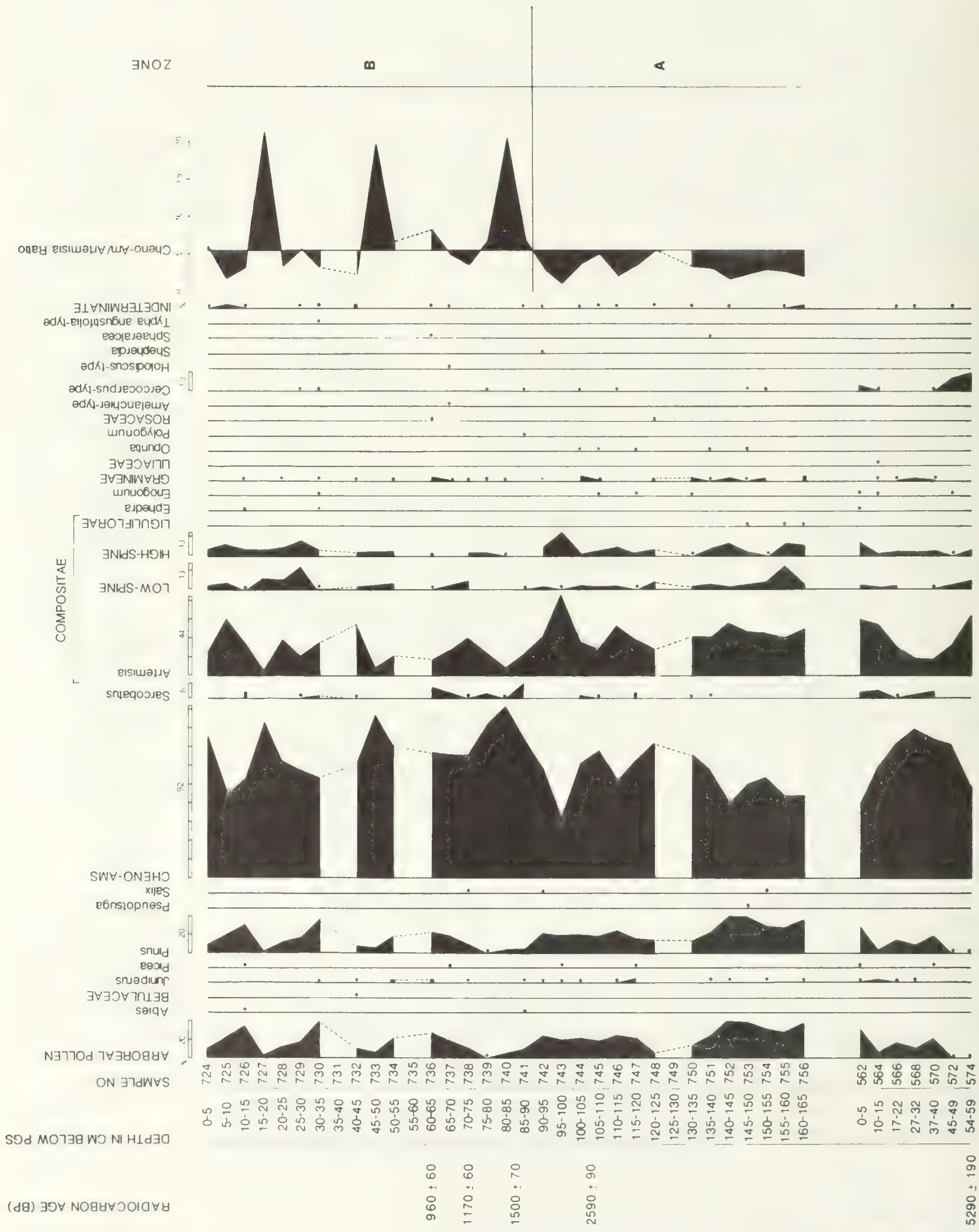


Figure 1. Stratigraphic pollen diagram, Taliaferro site.

Table 2. Pollen types observed in samples from the Taliaferro site.

Scientific Name	Common Name
ARBOREAL POLLEN:	
Abies	Fir
Betulaceae	Birch family
Juniperus	Juniper
Picea	Spruce
Pinus	Pine
Psuedotsuga	Douglas fir
Quercus	Oak
Salix	Willow
NON-ARBOREAL POLLEN:	
Cheno-ams	Includes amaranth and pigweed family
Sarcobatus	Greasewood
Cleome	Beeweed
Compositae:	Sunflower family
Artemisia	Sagebrush
Low-spine	Includes ragweed, cocklebur, etc.
High-spine	Includes aster, rabbitbrush, snakeweed, sunflower, etc.
Liguliflorae	Includes dandelion and chickory
Cruciferae	Mustard family
Cyperaceae	Sedge family
Ephedra	Mormon tea
Eriogonum	Wild buckwheat
Gramineae	Grass family
Liliaceae	Lily family
Opuntia	Pricklypear cactus
Polygonum	Knotweed
Rosaceae	Rose family
Amelanchier-type	Serviceberry
Cercocarpus-type	Mountain mahogany
Holodiscus-type	Ocean-spray
Shepherdia	Buffaloberry
Sphaeralcea	Globe-mallow
Typha angustifolia-type	Cattail

pollen and moderate quantities of Artemisia pollen. This zone extends from the base of the pollen record to a depth of approximately 90 cm below the present ground surface. The first half of this zone is characterized by gradually increasing values for Cheno-am pollen and relatively consistent frequencies of Artemisia pollen. Between a depth of 120 to 90 cm, however, fluctuations in the Cheno-am and Artemisia frequencies are observed in direct opposition to one another. The Pinus pollen frequencies are at their highest in the lower portion of Zone A then decrease slightly to remain constant throughout the upper portion of this zone. Gramineae pollen is observed more regularly in the lower portion of Zone A than in the upper portion of Zone A, and Opuntia pollen is recorded sporadically throughout Zone A.

The trends observed in the pollen record within Zone A, most notably the larger frequencies of *Pinus* pollen, stable values of *Artemisia* pollen, and more common occurrences of Gramineae pollen in the lower portion of Zone A, suggest that the environment was more mesic than at present. A decrease in *Pinus* pollen, accompanied by a drop in regularity of Gramineae frequencies and fluctuations within the Cheno-am and *Artemisia* quantities, suggests that the environment was warming and/or drying around 2590 years B.P. and for several hundred years on either side of this time. The warming and/or drying trend appears to have had a relatively minor effect on the distribution of pine as recorded by the long-distance transport of pine from the timbered ridges to the west. More notable are the on-site fluctuations, which result in variations in the frequencies of Cheno-am and *Artemisia* pollen at this date. While *Opuntia* pollen is recovered sporadically throughout Zone A and is absent from Zone B, quantities of *Sarcobatus* pollen within Zone A are relatively low. These two plants are noted to grow at the edges of active sand dunes. While the regular occurrence of *Opuntia* pollen within the stratigraphic samples suggests that the dune may have experienced some activity during this period, the relatively low frequencies of *Sarcobatus* pollen within this zone does not support this interpretation. Zone B is characterized by fluctuations in both the Cheno-am and *Artemisia* frequencies, a diminished Gramineae population, and fluctuations in the quantity of *Pinus* pollen. This site experienced numerous short-lived fluctuations in local environmental conditions during Zone B times (post-2590 years B.P.).

Cheno-am/*Artemisia* ratios were calculated for the stratigraphic samples at this site. Ratios are commonly used within pollen analysis in an effort to elucidate trends in the pollen data that may otherwise be obscured by the fluctuating pollen curves. A Cheno-am to *Artemisia* ratio was calculated for this site using raw data. It was hoped that this ratio would shed additional light on the fluctuations of these two major taxa, which fluctuate primarily in opposition to one another throughout the High Plains. Increasing Cheno-am values are associated with intervals of reduced effective moisture and increased soil alkalinity while increasing *Artemisia* values represent cooler and/or more mesic intervals, particularly when accompanied by increases in the Gramineae frequency. The ratios are diagrammed about the mean. Deviations to the left indicated cooler and/or more moist conditions while deviations to the right indicate warmer and/or drier conditions.

These ratios for Zone A fall consistently to the left of the mean, indicating that throughout Zone A, environmental conditions varied from slightly more mesic to considerably more mesic than when compared to the present. Zone A does not appear from any of the pollen evidence to have experienced marked warm and/or dry intervals.

Zone B extends from a depth of 90 cm below the surface to the present ground surface. This Zone is marked by abrupt variations in the pollen frequencies of both Cheno-ams and *Artemisia*. In addition, the *Pinus* values are noted to fluctuate throughout this interval. The *Pinus* pollen frequencies experience relatively low values near the beginning of Zone B, which corresponds to a radiocarbon age of 1500 years B.P. This drop in *Pinus* pollen is accompanied by a significant increase in Cheno-am pollen and a decrease in both *Artemisia* and Gramineae pollen. These factors suggest an intense warming and/or drying period. Conditions appear to ameliorate by 1170 years B.P. as *Pinus* pollen values begin to increase, Cheno-am frequencies decrease, and *Artemisia* and gramineae quantities increase. This period, from approximately 1170 to 900 years B.P., appears to be slightly more mesic to average for environmental conditions. Around 900 years B.P., *Pinus* pollen decreases rapidly, Cheno-am pollen increases, and *Artemisia* pollen and Gramineae pollen decrease, signaling another intense, but short-lived, warm and/or dry interval. Insufficient pollen for analysis was recovered from depths of 55 to 60 and 35 to 40 cm on both sides of this warm and/or dry episode. Pollen concentrations are expected to be less during periods of rapid aggradation of sand dunes, which may be represented here. A peak in pine pollen was observed at 30 to 35 cm below the surface and another at 10 to 15 cm below the surface. Between these two depths, the pine pollen decreases, the *Artemisia* and Gramineae pollen fluctuate, and the Cheno-am frequencies increase in a single, intense spike. This indicates another intense, but short-lived, warming and/or drying condition.

The tree ring record from the Colorado River Valley to the south records an intense drought during the A.D. 1200s, which corresponds to approximately 650-750 years B.P. This event may be represented by the middle peak in the Cheno-am/*Artemisia* ratio which denotes an intense dry interval at the Taliaferro site. This period is followed in the tree ring record by a period of equally intense increases in moisture and flooding during the 1300s, or 550-650 years B.P. The pollen record at the Taliaferro site records a return to more mesic conditions following the drought. A final short-lived, intense drought is observed in the tree ring record at A.D. 1573 to 1593, or 357-377 years B.P. Again, the pollen record at the Taliaferro site exhibits a short-lived, intense episode of drier conditions relatively close to modern times. This drought overlaps with the Little Ice Age, which lasted from A.D. 1550 to 1850, or 400-100 years B.P. The pollen record at the Taliaferro site demonstrates an increase in pine pollen, which would be expected with cooler temperatures, as the trees descended to a lower elevation. The pollen record at this site appears to reflect both of the short-lived drought conditions, which may have acted to change the local vegetation by reducing the sagebrush and grass populations. The pollen record also reflects the cooler conditions of the Little Ice Age, which would have had the effect of increasing the pine pollen in the site deposits through transport from the lower elevations on the slopes and foothills of the Overthrust Belt.

The Cheno-am/*Artemisia* ratios for Zone B exhibit evidence of an environment that generally fluctuated between slightly more mesic and slightly more xeric conditions, punctuated by three intense, short-lived periods of warm and/or dry conditions. These episodes fall at 1500 years B.P., around or after 900 years B.P., and shortly before the proposed association with the Little Ice Age at 400-100 years B.P. The intervals between the end of the second intense warm/dry period and the present appear to have been generally more mesic and/or cooler than the average punctuated by the third intense warm/dry interval. The longest period of apparent xeric conditions falls approximately 900 years B.P. and immediately after.

Pollen Column 2, taken from the north half of Excavation Area A, represents a shallower but far older deposit than Column 1. The present ground surface is represented by Sample 562, taken from a depth of 0 to 5 cm below the present ground surface. This area contains larger quantities of both *Artemisia* and High-spine Compositae pollen and a much smaller frequency of Cheno-am pollen in the surface sample than for the other pollen column. The basal sample from this column is associated with a radiocarbon age of 5290 years B.P. This sample exhibited a pollen signature relatively similar to that of the present ground surface with the exception that the pine pollen frequency is considerably lower and the *Cercocarpus* frequency much larger. Component I is represented by Sample 572 at a depth of 45 to 49 cm. Cheno-am pollen increases while *Artemisia* pollen decreases in this sample, which begins a trend that continues until approximately Component II. Although the on-site vegetation suggests more xeric conditions, this trend is accompanied by a slight increase in Pinus pollen frequencies. Component II is represented by Sample 566 taken at a depth of 17 to 22 cm. The Cheno-am values are still relatively high at this point and the sagebrush frequency depressed. While the Pinus pollen frequencies are higher than those at the base of the pollen record, they are not observed in high frequencies. It appears that the dune surface in this location has undergone a considerable amount of erosion between Component II times and the present, as there is no record of deposits for at least the last 3000 years in this area. When this pollen record is compared to that of Pollen Column 1, the high frequencies of Cheno-am pollen, accompanied by relatively low frequencies of Artemisia, Pinus, and Gramineae pollen in these samples, suggest a relatively xeric environment for the cultural occupations of Components I and II.

To summarize the paleoenvironmental data, ternary plots comparing Cheno-ams to Artemisia to High-spine Compositae were drafted for pre-2500 years B.P., 2590 to 1500 years B.P., 1500 to 900 years B.P., and post-900 years B.P. time intervals (Figure 2). The pre-2500 years B.P. interval exhibits the highest Artemisia in comparison with Cheno-am values, indicating that sagebrush was more dominant in the local vegetation on the ridgetop on a regular basis than it has been at any time since 2500 years B.P. The Late Archaic occupations spanning 2590 to 1500 years B.P. fall within the range of the vegetation pattern exhibited earlier in that these samples exhibit generally more Artemisia and less Cheno-am pollen than do later samples. The peoples occupying the ridge at this time had a slightly different resource base from which to select than did later occupants. The Late Prehistoric occupations from 1500 to 900 years B.P. were present at the time when the Cheno-am populations were consistently at their highest on the ridgetop. Clusterings of the vegetation are almost totally outside those observed prior to 1500 years B.P. The peoples who occupied the Taliaferro site during the Late Prehistoric times may have selectively altered the vegetation cover to support abundant resources producing copious amounts of small seeds that could be gathered and ground. The environment after 900 years B.P. fluctuates widely, which results in a constantly changing vegetation mosiac on the ridgetop. The vegetation community at the Taliaferro site appeares to have see-sawed back and forth between a dominance by Cheno-ams (saltbush) and Artemisia (sagebrush).

Subsistence

Pollen types identified as representing plants that may have been exploited during the occupation of the Taliaferro site include Cheno-ams, Cleome, Artemisia, High-spine Compositae, Cruciferae, Cyperaceae, Liliaceae, Opuntia, and Typha. A review of the ethnobotanic literature concerning specific utilization of these plants follows. It is a commonly accepted practice in archaeological studies to reference ethnological (historic) plant uses as indicators of possible or even probable plant uses in prehistoric times. Ethnographic sources document that with some plants, the historic use developed and carried from the past. Although the ethnobontanic literature refers to Native American cultures from historic times and may not be relevant to specific uses of individual plants by prehistoric cultures, it does provide generalized information that will help answer questions about the past. Ethnobotanic literature from the greater High Plains area is included in this discussion. Repetitive references to the exploitation of resources indicate a

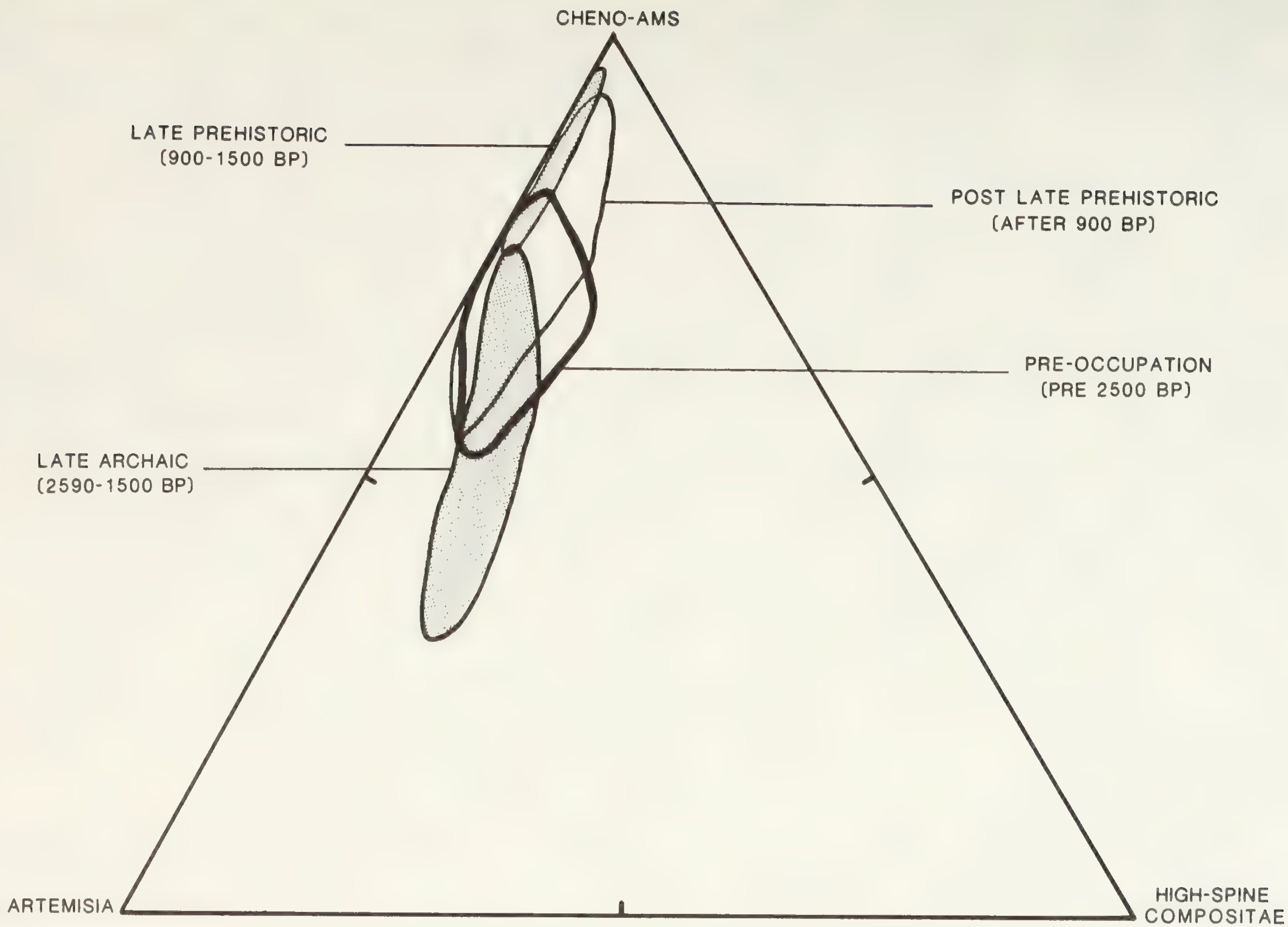


Figure 2. Ternary plot of stratigraphic pollen data, Taliaferro site.

widespread utilization and strengthen the possibility that the same or similar resources were used during prehistoric times.

Cheno-ams were exploited for both their greens (cooked as a potherb) and seeds. The greens are most tender when young, in the spring, but may be used at any time. The seeds were ground and used to make a variety of mushes and cakes (Chamberlin 1964:366; Gallagher 1977:12-16; Gilmore 1977:26; Harrington 1967:55, 57, 71; Rogers 1980:43, 66).

Cleome is noted to have been used as a food source. The young plants are usually gathered and boiled for food. The seeds may also be gathered and ground into meal, although utilization as a potherb appears to have been more common (Harrington 1967:72).

Artemisia seeds are oily and nutritious and are reported to have been widely gathered and used as a food. The leaves also were used to cover berries and food preserved in caches or to make a medicinal tea used in febrile conditions (Chamberlin 1964:362-363). Crushed sagebrush leaves were mixed with stored meat by the Blackfoot (Hellson and Gadd 1974:101).

Helianthus (sunflower) is a member of the morphological pollen group of High-spine Compositae. Sunflower seeds are very rich in oil and may have been ground into paste for batter or roasted and eaten. Other members of the Compositae family were used in a variety of ways, including medicinally and as food. Another species of Helianthus (Jerusalem artichoke) produces roots which may be boiled or baked and eaten (Harrington 1967:313-315). Rabbitbrush may be used as fuel.

Several members of the Cruciferae (mustard) family are noted to have been exploited for their greens, which were used as potherbs while the plant was young. In addition, seeds may have been parched, ground into flour, and used for making pinole, mush, bread, or to thicken soup (Harrington 1967:308; Rogers 1980:61).

Cyperus (a member of the Cyperaceae family) tubers may be boiled, peeled, then eaten, although they may also be ground into flour. The inner base of the stems and tubers may also be eaten raw. Cyperus prefers moist ground and may grow in fields as weed (Harrington 1967:174).

Both wild onion (Allium) and sego lily (Calochortus) fall within the approximate size range of Liliaceae pollen recovered at the Taliaferro site. These plants are noted to have been frequently exploited by many Native American groups. Wild onion may be utilized as flavoring for stews or meats, boiled and eaten as a vegetable, or the juice may be used medicinally. Wild onions appear to have been extensively used in the past and were also dried and stored for future use (Gilmore 1977:19; Harrington 1967:345-346; Hellson and Gadd 1974:100; Smith 1974:271; and Yanovsky 1936). Several parts of the sego lily are edible, including the greens, seeds, bulbs, and flowers. The bulbs constitute the most usable portion of the plant and were frequently boiled. They may also be stored for future use (Harrington 1967:159-161).

Opuntia fruits were a commonly exploited resource ethnohistorically. The fruits were eaten raw, stewed, or dried for winter use, and the stems were also peeled and roasted. The roots were boiled to make a medicinal tea (Rogers 1980:61). In addition, the seeds may have been parched and ground into meal to be used to make mushes or cakes. The spines may have been burned off both the fruit and stems in preparation for consumption (Harrington 1967:24), thus introducing pollen into a fire hearth.

Typha is a rich source of nutrients. Steward (1938) and Chamberlin (1964) note the utilization of cattail as food, and Harrington (1967) describes the use of both pollen and the seed-like fruits of cattail as food resources. The young pollen-producing flowers may be stripped from the spikes, or the pollen may be removed by shaking the mature flowers. The resulting flowers and/or pollen may be mixed with flour. Flour made from cattail roots, which are best harvested in the fall, is similar with respect to quantities of fats, proteins, and carbohydrates to flour obtained from wheat, rice, and corn (Harrington 1967).

Component I, with a radiocarbon age of 5290 ± 190 years B.P., represents the earliest evidence of occupation at the Taliaferro site. This component is represented by three pollen samples (Table 3, Figure 3). Sample 1753 is a control sample taken from a rock found within the component. Sample 537 is from Feature 25, a small, basin-shaped firepit, and Sample 518 represents Feature 19, also a small basin-shaped firepit. Pollen sample 537, taken from Feature 25, contained the largest quantity of Cheno-am pollen observed for this time period, suggesting that Cheno-am seeds may have been roasted in this feature, or the greens cooked. The relatively high Artemisia pollen frequency recovered from Feature 19 (Sample 518) may reflect the use of sagebrush as a fuel. The presence of small quantities of Opuntia pollen in both features may also be associated with the use of or processing of this resource. Opuntia pollen is absent from the control sample. Other pollen types noted and frequencies recorded for the features of Component I do not appear to be indicative of economic activity.

Component II was not radiocarbon dated but falls stratigraphically after Component I. This component is represented by pollen Sample 513 from Feature 13, a medium, basin-shaped pit, and Sample 532 from Feature 21, also a medium, basin-shaped pit. The pollen record from these two features provides no subsistence data.

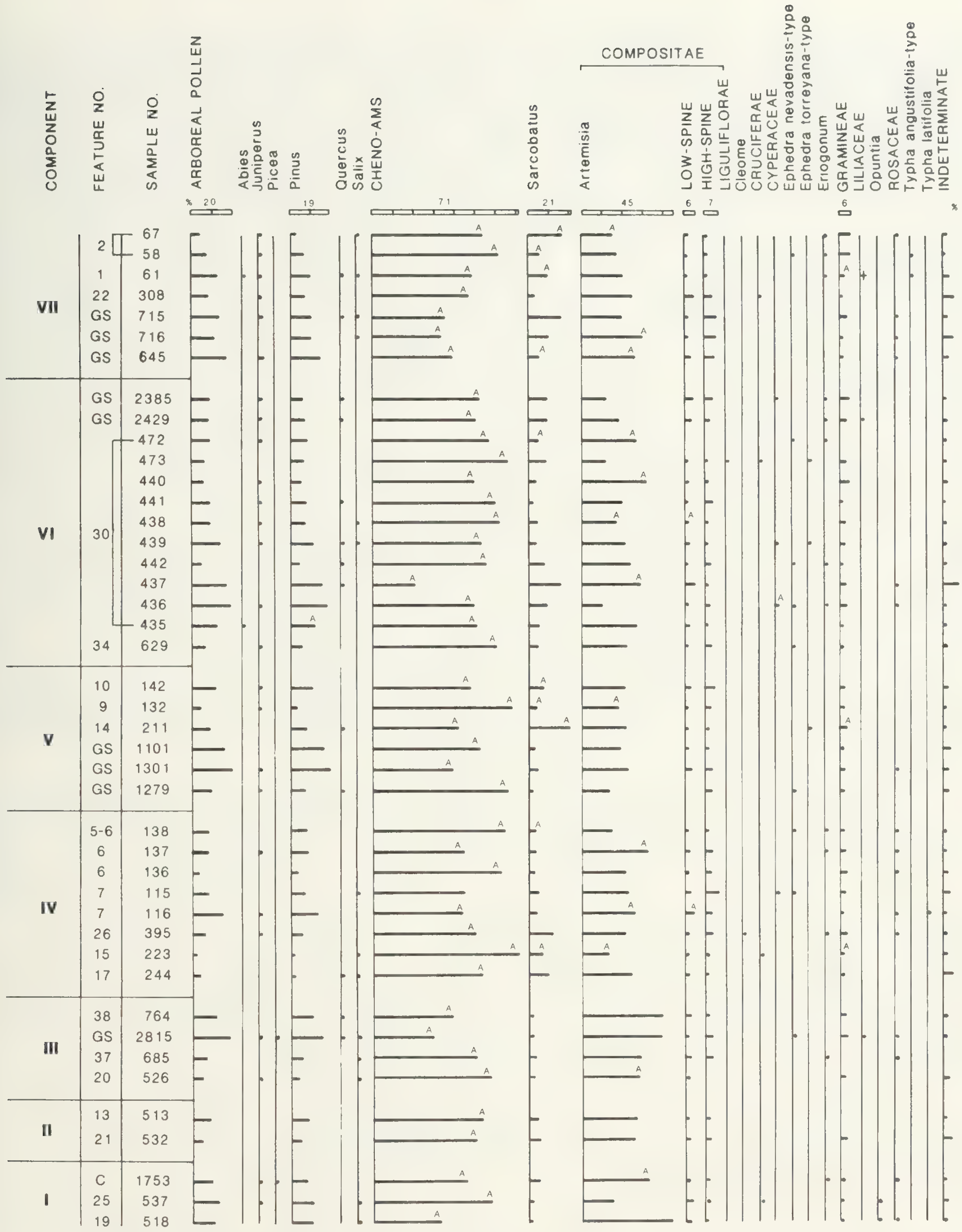
Four features from Component III were analyzed for their pollen content. Radiocarbon ages of 2850 ± 90 and 2590 ± 90 years B.P. were returned for Features 38 and 28, respectively, within the south half of Excavation Area A. Feature 20, which was found in the north half of Excavation Area A, returned a radiocarbon age of 1910 ± 110 years B.P. Features 37 and 38 were both rock-filled basins, and only Feature 38 exhibited evidence of oxidation. Feature 20 was a medium, basin-shaped pit containing no evidence of oxidation.

Sample 764, taken from Feature 38 in the south half of Excavation Area A, exhibited pollen frequencies very similar to those of the general environment. An unshaped slab metate (SCL14.2815) recovered to the east of the location of Pollen Column 1 was sampled. This sample also exhibited pollen frequencies very similar to those recovered from the general environment although a single grain of Liliaceae pollen was recovered from the ground surface. The association of Liliaceae pollen primarily with groundstone at this site suggests that the occupants of this site may indeed have gathered sego lily seeds and ground them for food. Sample 526, representing Feature 20, exhibited a high frequency of Cheno-am pollen associated with utilization or processing of a member of this group of plants within the feature. Feature 37, represented by Sample 685, also exhibited an elevated Cheno-am frequency, although fewer aggregates were recorded. It is possible that Cheno-am greens or seeds were processed in this feature.

Component IV, which occurs in Excavation Area B, yielded a radiocarbon age of 1500 ± 70 years B.P. from Feature 17. A suite of samples in association with the multiple feature group consisting of Features 5, 6, and 7 were analyzed from this component as were the fills of three other features. Feature 5 was a small, basin-shaped pit exhibiting no evidence of oxidation; Feature 6 was a basin-shaped pit oxidized on the sides; and Feature 7 was a large, basin-shaped pit oxidized on the bottom. The other three features studied were located in the northern portion of Excavation Area B. Feature 26

Table 3. Provenience of pollen samples from features and groundstone at the Taliaferro site.

Sample No.	Feature No.	Component	Provenience	Pollen Counted
58	2	III	Outside Feature 2, an irregularly shaped pit	200
61	1	VII	Irregularly shaped pit, fill	200
67	2	VII	Irregularly shaped pit, fill	200
115	7	IV	Large basin-shaped pit, fill	100
116	7	IV	"Living surface" around Feature 7	200
132	9	V	Bell-shaped pit, fill	200
136	6	IV	Basin-shaped pit, fill	200
137	6	IV	"Living surface" around Feature 6	200
138	6	IV	"Living surface" around Features 5 and 6. Feature 5 is a small basin-shaped pit	200
142	10	V	Small basin-shaped pit, fill	200
211	14	V	Rock-filled basin, fill	200
223	15	IV	Oxidized basin, fill	200
645		VII	Shaped slab metate wash	200
244	17	IV	Medium basin-shaped pit, fill	200
308	22	VII	Rock-filled circular basin, fill	200
395	26	IV	Medium basin-shaped pit, fill	200
435	30	VI	"Living surface" around housepit	200
436	30	VI	"Living surface" around housepit	200
437	30	VI	"Living surface" around housepit	200
438	30	VI	"Living surface" around housepit	200
439	30	VI	"Living surface" around housepit	200
440	30	VI	"Living surface" around housepit	200
441	30	VI	"Living surface" around housepit	200
442	30	VI	"Living surface" around housepit	200
715		VII	Shaped slab metate wash	200
716		VII	Shaped slab metate wash	200
472	30	VI	Upper layer (fill), housepit	200
473	30	VI	Lower layer (fill), housepit	200
513	13	II	Medium basin-shaped pit, fill	100
518	19	I	Small basin-shaped firepit, fill	200
526	20	III	Medium basin-shaped pit, fill	200
532	21	II	Medium basin-shaped pit, fill	200
537	25	I	Small basin-shaped firepit, fill	200
685	37	III	Rock-filled basin, fill	200
629	34	VI	Large basin-shaped pit, fill	200
764	38	III	Rock-filled basin, fill	200
1101		V	Shaped slab metate wash	200
1279		V	Shaped mano wash	200
1301		V	Unshaped slab metate wash	200
1753		I	Control rock wash, unmodified	200
2385		VI	Unshaped slab metate wash	200
2429		VI	Shaped metate wash	200
2815		III	Unshaped slab metate wash	200



LEGEND:

GS - Groundstone

C - Control

Figure 3. Pollen diagram of features, Taliaferro site.

was a medium, basin-shaped pit and exhibited no evidence of oxidation. Feature 15 was an oxidized basin; and Feature 17 was a medium, basin-shaped pit that did not exhibit any evidence of oxidation. Sample 138 represents the living surface in the vicinity of Features 5 and 6. The pollen record in this sample is dominated by Cheno-am pollen and aggregates of Cheno-am pollen. This suggests that Cheno-ams were processed in the area between Features 5 and 6. Pollen Sample 137 represents the living surface in the vicinity of Feature 6. This sample exhibited considerably less Cheno-am pollen than did the nearby Sample 138 although a larger number of aggregates of Cheno-am pollen were recovered as was a fragment of a Cheno-am anther. The large number of Cheno-am aggregates and the anther fragment suggests that Cheno-ams may have been processed in this area. This sample (137) also contained a relatively high frequency of Artemisia pollen, as well as aggregates of Artemisia pollen, which suggests that sagebrush may have been stacked near this feature for use as a fuel or that it grew in proximity to the feature. Sample 136 is from the fill of Feature 6. This sample contained both a high frequency of Cheno-am pollen and a large number of aggregates of Cheno-am pollen, suggesting that this resource was processed in the pit.

Feature 7 is represented by Sample 115, taken from the fill of the feature, and Sample 116, taken from the living surface outside the feature. Sample 115 contained a moderate quantity of Cheno-am pollen as well as a large number of aggregates of this pollen type. In addition, the largest value of High-spine Compositae pollen for this component was recovered in the fill of this feature. This suggests that both Cheno-ams and a member of the High-spine Compositae group, possibly sunflower, were processed in this hearth. Sample 116, taken from the living surface outside the hearth, exhibited both a large quantity of Cheno-am aggregates and a few aggregates of Artemisia pollen. The presence of Artemisia aggregates may reflect stacking sagebrush next to the firepit for use as fuel.

The three features from the northern portion of Excavation Area B, Features 26, 15, and 17, exhibited fluctuating frequencies of Cheno-am pollen accompanied by numerous aggregates of this pollen type. The largest quantity of Cheno-am pollen and a fragment of an anther of Cheno-am pollen was recovered from the fill of Feature 15. While the frequencies of Cheno-am pollen alone are not sufficient to indicate exploitation of the resource, the presence of a large number of aggregates of this pollen type within these samples suggests that Cheno-ams were processed in all three of these features, particularly Feature 15. The higher frequencies of Sarcobatus pollen in Features 26 and 15 may reflect either a difference in local vegetation between Excavation Areas A and B or may reflect the use of greasewood as a fuel within these features. A single grain of Cleome pollen was recovered in Feature 26, suggesting that this resource may also have been processed in the pit. Feature 15 yielded numerous aggregates of Artemisia pollen, suggesting that sagebrush may have been used as a fuel. Cruciferae pollen was also recovered from this feature, suggesting that a member of the mustard family may have been processed in the feature.

Component V is represented by pollen samples from three features (Features 9, 10, and 14) and washes of three pieces of groundstone. A radiocarbon age of 1310 ± 70 years B.P. was returned from Feature 14, a rock-filled basin exhibiting evidence of oxidation. Feature 10 was a small, basin-shaped pit, and Feature 9 was a bell-shaped pit. Two of the pieces of groundstone (SCL14.1101 and 1301) were associated with Feature 14. The remaining piece of groundstone (SCL14.1279) was recovered approximately equidistance between Features 9 and 14, very close to Feature 24.

Sample 142, representing Feature 10, exhibited a moderately high frequency of Cheno-am pollen as well as small aggregates of this pollen type. This suggests that Feature 10 may have functioned as a processing pit for processing Cheno-ams, in the absence of oxidation. The large, bell-shaped pit (Feature 9, Sample 132) yielded a larger quantity of Cheno-am pollen and numerous aggregates of this pollen type. The pollen record suggests that Cheno-am seeds were probably stored or processed in this pit.

Sample 211 represents Feature 14, a rock-filled basin that contained a shaped slab metate (SCL14.1101). Sample 211, from the fill of the firepit, exhibited a moderate frequency of Cheno-am pollen accompanied by numerous aggregates of this pollen type. An elevated frequency of Sarcobatus pollen was recovered from the fill, suggesting that greasewood may have been used as a fuel within the hearth. An aggregate of Gramineae pollen was also recovered within this sample, suggesting that grass seeds, as well as Cheno-am seeds, may have been parched or roasted in this feature. A shaped slab metate (SCL14.1101) recovered from the fill of this feature exhibited a slightly higher frequency of Cheno-am pollen than did the feature fill and only a small aggregate. The pollen record, then, suggests that this metate may have been used to grind Cheno-am seeds. Very little Sarcobatus pollen was recovered from the metate wash, which strengthens the interpretation that greasewood was used in the firepit, perhaps as a fuel. The unshaped slab metate (SCL14.1301) located less than a meter to the northeast of Feature 14 exhibited only a moderate Cheno-am frequency and only a single small aggregate of this pollen type. No other pollen frequencies are high enough to signal food processing using the metate. Therefore, no interpretation of utilization of this metate is possible. A shaped mano (SCL14.1279) recovered close to Feature 24 yielded a large quantity of Cheno-am pollen as well as a small quantity of aggregates of this pollen type, which indicates that Cheno-am seeds were ground using this shaped mano.

Component VI is represented by a radiocarbon age of 1170 ± 60 years B.P., which was returned for Feature 30. This component also contained Feature 34, which underlaid Feature 30, and is thought to date approximately 1500 years ago. All of the samples analyzed for pollen were recovered in Excavation Area A where Component VI represents the entire Late Prehistoric period from 900 to 1500 years B.P.

Two features and two pieces of groundstone represent Component VI in the pollen record. Feature 30 was a large, stratified, basin-shaped pit (possibly a structure) measuring approximately two meters in diameter. Two pollen samples were removed from the fill of this feature, and a suite of eight samples were taken from the living surface surrounding the feature (Figure 4). In addition, two pieces of groundstone were recovered from the same general excavation level, and these were washed. Feature 34 is represented by a single pollen sample.

Feature 34, a large, basin-shaped pit, is thought to date to approximately 1500 years B.P. The fill of this feature is represented by Sample 629, which contained a moderately large quantity of Cheno-am pollen and aggregates of this pollen type. This indicates the processing of this resource in this pit.

Two samples were taken from the fill of Feature 30. Sample 472 represents the upper fill, and Sample 473 represents the lower fill. The dominant element within both samples is Cheno-am pollen. Aggregates of Cheno-am pollen were also recorded in both samples, suggesting that this resource was utilized or processed within the feature. The lower fill contains the highest quantity of Cheno-am pollen. Cruciferae pollen was recovered from the lower fill,

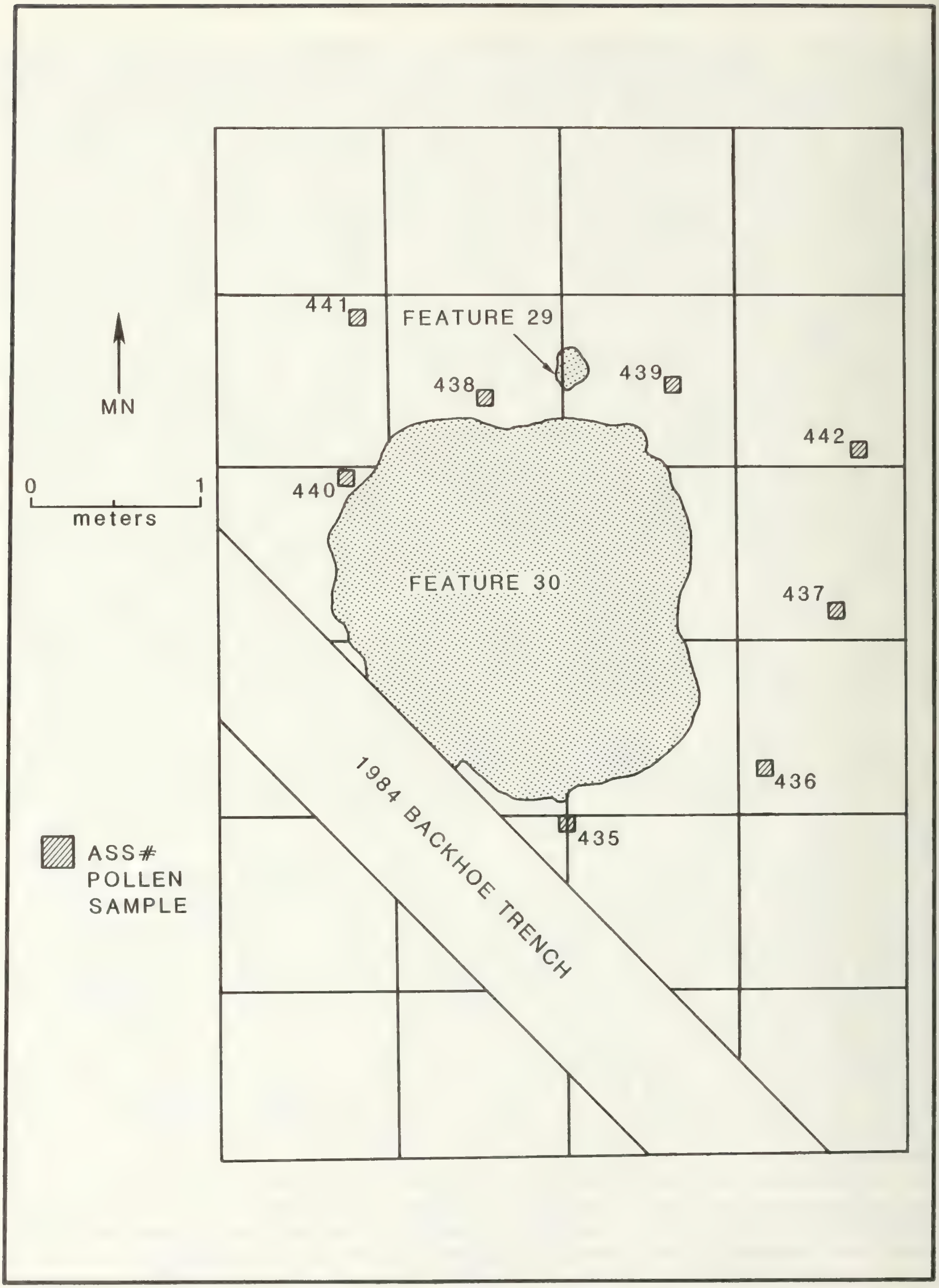


Figure 4. Plan map showing location of pollen samples taken from the occupation floor surrounding Feature 30, Taliaferro site.

suggesting that this resource was also processed in the structure. Considerably more Artemisia pollen, as well as aggregates of this pollen type, was recovered from the upper fill than from the lower fill; aggregates of Artemisia pollen were also recovered. This suggests that sagebrush may have been used in making the superstructure of this feature. Plants which would be expected to be weedy colonizers of the abandoned pit (Cheno-ams and Low-spine Compositae) were not observed. This suggests that the pollen is representative of accumulation during occupation rather than following abandoment.

A series of eight pollen samples were taken from the living surface outside Feature 30. The location of the samples taken are shown in Figure 4. These samples are discussed and shown on the pollen diagram (Figure 3) beginning at the northwest side of the structure and progressing clockwise around to the southern edge of the structure. These samples exhibited fluctuating frequencies of Cheno-am pollen. The highest Cheno-am frequencies and a larger number of Cheno-am aggregates were observed at the northern edge of the feature (438) and again on the eastern (442) and southern (436,435) sides. The highest Artemisia frequencies were recovered from Samples 440, 437, and 435, representing the northwest, east, and south sides of Feature 30, respectively. Sample 438 contained the largest quantity of Artemisia aggregates. These may be associated with activities involving sagebrush or, more probably, with variations in the natural vegetation. A small quantity of Cyperaceae pollen and aggregates of this pollen type were recovered from Sample 435 to the southwest of Feature 30.

Two pieces of groundstone, including an unshaped slab metate (SCL14.2385) and a shaped metate (SCL14.2429), were recovered farther to the north of Feature 30. These samples exhibited moderately high Cheno-am frequencies. Relatively few aggregates of Cheno-am pollen were recovered from the wash of the surface of these two metates. The pollen evidence suggests that both metates may have been used to grind Cheno-am seeds. A single grain of Liliaceae pollen was recovered from the shaped metate (SCL14.2429). Liliaceae pollen is primarily associated with metate wash samples at this site, which suggests that sego lily (Calochortus) seeds may have been collected and ground. Other evidence of food processing is lacking in the metate wash samples.

Component VII is represented by a radiocarbon age of 960 ± 60 years B.P. returned from Feature 22. Seven pollen samples were analyzed for Component VII. Samples 67 and 58 were taken from the fill and living surface around Feature 2, respectively. Feature 2 was an irregularly shaped pit containing evidence of oxidation on the bottom. The sample taken from the interior of the feature (67) exhibited a slightly smaller quantity of Cheno-am pollen and a greater amount of Sarcobatus pollen than was recovered from the living surface outside the feature. This suggests that greasewood may have been among the fuels burned within this feature, and Cheno-am seeds may have been processed. The high frequency of Cheno-am pollen and presence of aggregates in Sample 58 representing the living surface outside Feature 2 suggests that this area was used to process Cheno-ams. A single grain of cattail (Typha) pollen was recovered outside the feature and may represent either utilization of this resource or wind transport of the pollen. In either case, the presence of cattail pollen indicates that this resource was present in the environment and available for exploitation.

Feature 1, also an irregularly shaped pit exhibiting oxidation on the bottom, is represented by Pollen Sample 61. This sample contained a moderately high frequency of Cheno-am pollen as well as numerous aggregates of this pollen type. In addition, a single grain of Liliaceae pollen and a single grain of cattail (*Typha*) pollen were recovered from this sample. The pollen record suggests that Cheno-am seeds, a member of the lily family, and cattail may have been processed within this feature.

Feature 22 is represented by a sample taken from its fill (308). The feature was a rock-filled, circular basin which did not exhibit evidence of oxidation. This sample exhibited a moderately high frequency of Cheno-am pollen as well as a few aggregates of this pollen type suggesting that Cheno-am seeds may have been processed within the feature. A single grain of Cruciferae pollen was recovered in this sample, which suggests the possibility that a member of the mustard family was also processed.

Three pieces of groundstone were recovered from the living surface between Features 1, 2, and 22. All three pieces are described as shaped slab metates. The pollen records of these three metates are nearly identical to one another. They all exhibit relatively low Cheno-am frequencies and a few small aggregates of this pollen type. All three samples exhibit small quantities of both Low-spine and High-spine Compositae pollen, probably resulting from wind transport from local vegetation, and small quantities of grass pollen, also probably representing wind transport from the local vegetation. Slightly dissimilar frequencies of *Artemisia* pollen were recovered for the samples, but none high enough to suggest processing sagebrush seeds. No evidence for food processing activity involving use of metates was recovered from these samples.

SUMMARY AND CONCLUSIONS

Pollen analysis at the Taliaferro site encompasses paleoenvironmental reconstruction and a look at subsistence throughout the occupational sequence at the site. The stratigraphic pollen record demonstrates that the vegetation throughout the time of occupation has never been markedly different from that of the present. Although the frequencies of various plants undoubtedly fluctuated within the vegetation community, the general community may be characterized as falling within the Upper Sonoran life zone throughout the length of time represented by Pollen Column 1, which is over 3000 years in age. Indeed, the limited pollen evidence from Pollen Column 2 suggests that the vegetation in this area may be described as typical of the Upper Sonoran Zone for at least the last 5000 years. Variations within the major vegetation types throughout the past 3000 years is examined with the aid of both the Cheno-am/*Artemisia* ratio and ternary plots. The Cheno-am/*Artemisia* ratios demonstrate fluctuations within the Cheno-am (primarily saltbush) and *Artemisia* (sagebrush) communities through time. Increasing sagebrush and decreasing saltbush frequencies within the pollen record may be responses to decreased soil salinity, decreased temperatures, and/or increasing effective moisture. Although the sagebrush population increased compared to that of today, there is no evidence that the vegetation community was more typical of the Transition Zone than the Sonoran Zone. The ratios demonstrate that prior to 1500 years B.P., the environment was cooler and/or more moist than it is today. This resulted in a larger portion of the shrub community being sagebrush and a reduction in the saltbush population compared to the present. This is exhibited on the two ternary plots labeled pre-2500 years B.P. and 2590 to 1500 years B.P. Relatively stable paleoenvironmental conditions are recorded from the base of the stratigraphic column to approximately 2500 years B.P. During this interval, sagebrush was more prominent within the vegetation community than it is today. Between 2590 and 1500 years B.P., the environment was generally more mesic and/or cooler than that of today, although fluctuations are evident. The ternary plot of the vegetation suggests that during this period there was a dramatic increase in the sagebrush community and/or a concommitant decrease in the saltbush community.

A change in the environment is noted approximately 1500 years B.P. at the Taliaferro site, which continues until approximately 900 years B.P. This interval may be described as more similar to conditions of today, punctuated by a severe warm and/or dry episode. On the ternary plots, this time period (the Late Prehistoric) displays a vegetation cluster in the corner representing domination by Cheno-ams, or saltbush. These conditions appear to have been relatively constant throughout this Late Prehistoric occupation.

The vegetation represented in the pollen samples after 900 years B.P. displays considerable variation. The vegetation community varies from that noted in the Late Prehistoric, which is dominated by saltbush, to that of previous periods, which display much larger quantities of sagebrush.

The fluctuations in vegetation between the various time periods of occupation provide evidence of the immediate vegetation in the the vicinity of the site which was available for exploitation by the occupants. The most intense occupation at the site falls within the Late Prehistoric period, in which the vegetation on the ridgetop was dominated by saltbush. Conditions during the Late Prehistoric are noted to be relatively similar to those of the present and varying to warmer and/or drier conditions. Vegetation in the vicinity of this site appears to be very conducive for human exploitation. The large community of Chenopodium observed in the playa on the floodplain south of the site is a concentration of a valuable food resource, which appears to be reflected in the pollen record of the features and groundstone. Cheno-am pollen was the single most frequent pollen type to be associated with economic activities in the pollen record. Large aggregates of this pollen type were present in numerous feature samples. Larger than average quantities of Cheno-am pollen, as well as aggregates of this pollen type, were frequently recovered in association with features and/or groundstone at this site. Evidence of the use of sagebrush, possibly as fuel, and possible exploitation of the seeds as a food resource, is noted in several samples. Concentration of this use appears to fall within the earlier periods of occupation. Limited evidence of the use of greasewood, probably as a fuel, is also recovered at this site. Limited use of a member or members of the High-spine Compositae group was also recovered in Components II, IV, and V. Small quantities of Cyperaceae pollen were recovered and may be associated with economic activity or derived from the local vegetation community.

Exploitation of vegetal resources appears, from the pollen record, to be concentrated on the vegetation communities close to the site. The Chenopodium concentration in the playa, the riparian community along the stream, and the vegetation of the ridge itself appear to have provided the majority of the vegetation exploited.

APPENDIX E

ANALYSIS OF ANIMAL REMAINS

By L. L. Harrell

Faunal remains were recovered from the eight cultural components at the Taliaferro site. These consist of a total of 1265 specimens represented by bone and teeth from mammals, birds, and fish and shell fragments from bird eggs and freshwater mussel. This material was recovered from both test and block excavations. Other faunal remains, represented by bone artifacts (beads), are described in Appendix B and have not been included in this discussion.

After a description of the specific methods applied to the faunal analysis, the results are presented by discussion of each attribute, or variable, considered in the analysis. Finally, conclusions are offered as interpretations for each component about the activities represented in the faunal remains.

METHODS

The analysis of these faunal remains focuses on the interpretation of cultural behavior, activities, and adaptations with attention to natural environmental processes that are revealed in attributes of the bone. In order to produce data relevant to these analytical orientations, the following attributes were recorded whenever applicable to a specimen: provenience, weight, natural modification, taxonomic classification, estimation of animal size (for nonspecific taxa only), anatomical element, completeness or portion of element present, side of the body, sex, age, size of fragment, and cultural modification. All of these attributes were recorded as variables for entry and processing by computer (Harrell and Swenson 1986). Explanations of the analytical methods applied to some of these variables are summarized below.

Natural modification to bone may be caused by a number of geological and biological agents and may produce a variety of features (Gilbert 1980:9-10). Here these modifications have been abbreviated into two basic types that are most commonly encountered: gnawing by animals and surface weathering. Bones that are gnawed by rodents, carnivores, and artiodactyls show distinctive marks left by the teeth of these animals (Gilbert 1980:10).

The degree of surface weathering was recorded using Behrensmeyer's (1978) six stages of weathered condition of the exterior bone surface. This was done in order to quantify some evidence of predepositional conditions, or environment, and to help distinguish intrusive, nonarchaeological specimens. As a result, the specimens representing burrowing animals, such as rodents, were found to be in unusually good condition compared to specimens of the larger species assumed to be culturally associated. Because of their excellent condition and the fact that the specimens represent animals observed to be currently inhabiting the site, rodent bones were considered as a separate analytical category that received minimal attention compared to the faunal remains resulting from human behavior.

For taxonomic identification, the most specific classification was attempted. This produced two broad categories: identified taxa and unidentified taxa. The category "identified taxa" refers to specimens that were identified to order, family, genus, or species. The category "unidentified taxa" refers to specimens that could be identified accurately to class only; i.e., mammal, aves, amphibian. Whenever possible, an estimation of animal size was applied to the less specific taxa to make these generalized classifications slightly more informative. In the order Artiodactyla, "small to medium artiodactyl" refers to specimens that could not be distinguished as deer or pronghorn and "large artiodactyl" refers to specimens that could not be recognized positively as elk or bison. In the category "unidentified taxa," estimation of animal size is applied to the Class Mammalia so that "large mammal" refers to species larger than coyote, "medium mammal" refers to animals ranging in size from coyote to larger than jackrabbit, and "small mammal" refers to species the size of jackrabbit and smaller. In this last group, small mammal, the term "mammal" is used as a convenience; the category is meant to imply "small animal," because most birds and lower classes of animals would potentially fall into this group. The intermediate size grades, "small to medium" and "medium to large," were necessarily included to encompass the more fragmentary specimens that could not be discriminately placed in any one of the other size categories.

Anatomical elements were identified using comparative faunal collections at Western Wyoming College and at the University of Wyoming. References, such as Gilbert (1980), Gilbert et al. (1981), and Olsen (1973 and 1979), were employed as aids in specific identification. Fragments were specified as to their location and orientation on the element using terms defined by Bass (1971) and Gilbert (1980). A determination of the side of the body was attempted for the identifiable elements, although some elements, such as artiodactyl phalanges and the more fragmentary specimens, prohibited such detail.

Identification of the sex of the animal was possible in some of the more complete specimens. This variable may serve as an aid in calculating minimum number of individuals (MNI) and season of site occupation. However, the highly fragmented nature of most faunal samples rarely affords such detailed identification. Degree of epiphyseal union and tooth eruption were the main criteria used to determine age. For estimation of season of occupation, fairly restricted ranges in age must be identified. Broader ranges in age (i.e., adult and juvenile) were used as an aid in calculating MNIs.

Fragmentary specimens were measured to derive their maximum dimensions and then grouped into size grades of 1 cm increments. By doing this, quantified data were produced that may lead to interpretation of the methods of faunal resources processing.

Evidence of cultural modification was grouped into four categories: presence and degree of burning, spiral fracturing, traces of butchering, or cut marks and tool/ornament production. Presence of burning was noted and evaluated in terms of degree or amount of exposure to heat. Four degrees of burning were defined: (1) slightly burned specimens exhibit a portion that is grayed or blackened by exposure to heat; (2) completely burned specimens are uniformly grayed or blackened on all surfaces; (3) slightly calcined specimens have portions that are black, white, and/or bluish-gray due to extreme alteration from extensive exposure to heat; and (4) completely calcined specimens are uniformly altered from extensive heat exposure. An examination of the degree of burning may indicate details concerning the processing and/or disposal of animal resources.

Presence of spiral fracturing was tabulated for specimens that exhibited well defined evidence of this type of fracture as described by Gilbert (1980). Spiral fractures are considered to be indicative of breakage by percussion of fresh bone. Generally, compact bone, such as long bone shafts, will fracture in this way. This type of fracturing is viewed as evidence of intentional breakage by man for the purpose of marrow extraction and further reduction of bones for grease and/or juice processing.

Evidence of butchering is defined primarily by the presence of cut marks. Cut marks may appear as shallow scratches in restricted areas of elements or as deeper V-shaped grooves. By examining the distribution of cut marks in the remains of a species, details of the methods of butchering may be interpreted. Other evidence, such as presence of butchering units or gross manipulation of whole carcasses, may be interpreted from attributes of the entire faunal sample.

Tool/ornament production may take the form of intentional shaping before use, which leaves characteristic flake scars, cutting, sawing, or whittling marks and/or abundant striations resulting from abrasion for final shaping. Traces of wear, such as polish, may be superimposed over manufacturing scars or may be present on previously unmodified bone, as in the case of expediency tools (Johnson 1976). Specimens modified by tool/ornament manufacture were recognized during analysis and separated from the rest of the faunal remains. These specimens are described in Appendix B under Artifact Analysis.

Finally, minimum number of individuals (MNI) was calculated for identified taxa by examination of some of the variables defined above. Primarily, numbers of elements and their portions were quantified for each specific taxa, with consideration of side of body, sex, age, and individual characteristics. Generally, the small amounts of specifically identified specimens simplified calculations of MNIs.

RESULTS

The faunal remains were sorted by cultural component into three broad analytical groups that received variable amounts of attention (Table 1). The group "unidentified taxa" (defined above) was sorted by more general taxonomic and anatomical terms than the group "identified taxa." Generally, the unidentified taxa are represented by specimens that are too fragmentary to allow more detail in analysis. The group identified as rodent specimens was considered to be intrusive and noncultural and was identified and quantified by taxonomic classification only (Table 2). In the discussion of the cultural faunal remains, these rodent specimens are disregarded. Other rodent specimens that are burned or are from species that were not observed to be current inhabitants of the site are included in the cultural remains and not in Table 2.

Natural Modifications

The only form of natural modification in the sample is surface weathering. Some degree of surface weathering is present in most of the specimens (Table 3). Egg shell and mussel shell are not included in the evaluation of degree of surface weathering. In Behrensmeyer's (1978) scheme, Stage 0 represents a minimum or absence of weathering with degrees increasing to Stage 5, in which bone has deteriorated to unconsolodated splinters. Burned specimens, with surfaces that are altered by heating, and tooth enamel, which is structurally different from bone, generally exhibit less surface weathering than other specimens, increasing the frequencies in the lower stages of weathering. The majority (66%) of the specimens fall into Stages 0-2, a pattern that is reflected in most of the cultural components. This suggests that during most of the occupations, most of the bone was subject to slight to moderate amounts of weathering before being buried. This indicates a fairly rapid depositional environment. The exception is Component III, where a greater degree of weathering is represented by a higher percentage (52%) in Stages 3-5, reflecting a slightly slower rate of deposition.

Table 1. Summary of all faunal remains, Taliaferro site.

Taxonomic Group	Component I	II	III	IV	V	VI	VII	VIII	Total
Identified Taxa	-	1	22	42	60	88	56	5	274
% Column	-	6	19	21	19	26	23	28	22
% Row	-	+	8	15	22	32	20	2	100
% Burned	-	-	-	26	18	9	14	-	14
Unidentified Taxa	1	15	62	155	254	202	183	13	885
% Column	100	94	54	77	78	59	75	72	70
% Row	+	2	7	18	29	23	21	1	100
% Burned	100	20	31	28	25	18	20	31	23
Rodent Taxa	-	-	31	5	10	55	5	0	106
% Column	-	-	27	2	3	16	2	-	8
% Row	-	-	29	5	9	52	5	-	100
% Burned	-	-	-	-	-	-	-	-	-
Totals	1	16	115	202	324	345	244	18	1265
% Column	100	100	100	100	100	100	100	100	100
% Row	+	1	9	16	26	27	19	1	100
% Burned	100	19	17	27	23	13	18	22	19

Key: + = Less than 1%

Table 2. Summary of rodent remains, Taliaferro site.

Taxon		Component III	IV	V	VI	VII	Total
Ground squirrel <u>Spermophilus</u> sp.	N	27	5	4	41	3	80
	Weight	4.6 g	0.6 g	1.0 g	6.4 g	0.2 g	12.8 g
Pocket gopher <u>Thomomys</u> sp.	N	3	-	1	5	-	9
	Weight	0.5 g	-	0.1 g	2.7 g	-	3.3 g
Pocket mouse <u>Perognathus</u> sp.	N	-	-	-	1	-	1
	Weight	-	-	-	0.1 g	-	0.1 g
Vole <u>Microtus</u> sp.	N	-	-	-	-	1	1
	Weight	-	-	-	-	0.1 g	0.1 g
Harvest mouse <u>Reithrodontomys</u> sp.	N	-	-	-	-	1	1
	Weight	-	-	-	-	0.1 g	0.1 g
Unspecified rodent	N	1	-	5	8	-	14
	Weight	0.1 g	-	0.4 g	0.8 g	-	1.3 g
Total	N	31	5	10	55	5	106
	Weight	5.2 g	0.6 g	1.5 g	9.9 g	0.3 g	17.5 g

Table 3. Stages of surface weathering of bone, Taliaferro site.

	Component								
Stage	I	II	III	IV	V	VI	VII	VIII	Total
Stage 0	1	2	7	48	78	83	58	7	284
% Column	100	13	8	25	26	29	24	39	25
Stage 1	-	-	8	38	51	60	35	1	193
% Column	-	-	10	20	17	21	15	6	17
Stage 2	-	12	25	42	66	49	76	4	274
% Column	-	80	30	22	22	17	32	22	24
Stage 3	-	1	39	53	86	56	58	6	299
% Column	-	7	46	27	28	20	25	33	26
Stage 4	-	-	4	12	25	35	8	-	84
% Column	-	-	5	6	8	12	3	-	7
Stage 5	-	-	1	2	-	-	2	-	5
% Column	-	-	1	1	-	-	1	-	+
Total	1	15	84	195	306	283	237	18	1139

Key: + = Less than 1%

Although represented by minor percentages, the presence of considerably deteriorated bone from Stages 4 and 5 indicates that some portions of the cultural deposits were exposed to weathering agents for fairly extensive amounts of time. More than one-third of the specimens fall into Stages 3 to 5, evidenced by deterioration of the outer surface of the bone wall to splintered fragments of bone. This constituent of badly weathered specimens prohibited specific taxonomic identification, which increased the amounts of unidentified taxa.

Taxonomic Classification

A total of twelve taxa was identified to the level of genus. These are bison (Bison bison bison), mule deer (Odocoileus hemionus), pronghorn antelope (Antilocapra americana), jackrabbit (Lepus sp.), cottontail (Sylvilagus sp.), muskrat (Ondatra zibethicus), prairie dog (Cynomys sp.), ground squirrel (Spermophilus sp.), vole (Microtus sp.), sage grouse (Centrocercus urophasianus), sucker (Catostomus sp.), and freshwater mussel (Margaritifera sp.). Table 4 presents counts and weights by component of specimens representative of each of these taxa and the groups of unidentified taxa. The relative frequencies of the various taxa within each component are also shown for both count and weight. A taxonomic breakdown by weight is an important consideration for assessing the relative emphasis on the various taxa through indices such as meat weight (Grayson 1984:172). However, the small size of this sample limits the interpretive value of such calculations. In the following discussion of the taxonomic groups, frequencies are calculated from counts of specimens. Table 5 shows the counts and percentages of sized groups

Table 4. Counts (N) and weights (grams) of faunal specimens by taxon, Taliaferro site.

Taxon		Component								Total
		I	II	III	IV	V	VI	VII	VIII	
Bison	N	-	-	4 (5)	2 (1)	-	-	1 (+)	-	7 (+)
	Weight	-	-	93.7 (69)	14.9 (12)	-	-	9.2 (5)	-	117.8 (15)
Mule deer	N	-	-	-	-	1 (+)	1 (+)	1 (+)	-	3 (+)
	Weight	-	-	-	-	5.1 (3)	1.7 (1)	4.5 (2)	-	11.3 (1)
Pronghorn	N	-	-	1 (1)	3 (2)	2 (+)	5 (2)	21 (9)	-	32 (3)
	Weight	-	-	5.4 (4)	18.8 (15)	1.3 (+)	69.8 (51)	14.8 (8)	-	110.1 (14)
Artiodactyl	N	-	-	17 (20)	15 (8)	32 (10)	18 (6)	19 (8)	-	101 (9)
	Weight	-	-	12.0 (9)	27.9 (22)	68.2 (35)	14.5 (11)	28.6 (15)	-	151.2 (19)
Lagomorph	N	-	-	-	-	-	1 (+)	1 (+)	-	2 (+)
	Weight	-	-	-	-	-	0.1 (+)	0.1 (+)	-	0.2 (+)
Jackrabbit	N	-	-	-	13 (7)	12 (4)	3 (1)	8 (3)	-	36 (3)
	Weight	-	-	-	4.8 (4)	4.4 (2)	1.8 (1)	2.2 (1)	-	13.2 (2)
Cottontail	N	-	-	-	1 (+)	2 (+)	2 (+)	3 (1)	-	8 (+)
	Weight	-	-	-	0.2 (+)	0.2 (+)	0.4 (+)	0.6 (+)	-	1.4 (+)
Muskrat	N	-	-	-	2 (1)	-	5 (2)	-	-	7 (+)
	Weight	-	-	-	0.6 (+)	-	7.5 (5)	-	-	8.1 (1)
Prairie dog	N	-	-	-	-	-	2 (+)	-	5 (28)	7 (+)
	Weight	-	-	-	-	-	0.8 (+)	-	1.7 (26)	2.5 (+)
Ground squirrel	N	-	-	-	1 (+)	-	1 (+)	-	-	2 (+)
	Weight	-	-	-	0.1 (+)	-	0.1 (+)	-	-	0.2 (+)
Vole	N	-	-	-	1 (+)	-	-	-	-	1 (+)
	Weight	-	-	-	0.2 (+)	-	-	-	-	0.2 (+)
Bird	N	-	-	-	1 (+)	3 (1)	31 (11)	-	-	35 (3)
	Weight	-	-	-	0.7 (+)	2.1 (1)	9.1 (7)	-	-	11.9 (1)
Fish	N	-	-	-	1 (+)	-	12 (4)	-	-	13 (1)
	Weight	-	-	-	0.1 (+)	-	2.1 (2)	-	-	2.2 (+)

Table 4. Concluded.

Taxon		Component I	II	III	IV	V	VI	VII	VIII	Total
Large mammal	N	1 (100)	6 (38)	22 (26)	40 (20)	102 (32)	24 (8)	64 (27)	7 (39)	266 (23)
	Weight	0.5 (100)	3.2 (33)	15.5 (11)	35.1 (28)	89.0 (45)	14.3 (10)	84.4 (45)	3.7 (56)	245.7 (31)
Medium to large mammal	N	-	3 (19)	23 (27)	36 (18)	66 (21)	44 (15)	76 (32)	3 (17)	251 (22)
	Weight	-	1.3 (13)	8.1 (6)	9.6 (8)	17.7 (9)	8.6 (6)	18.7 (10)	0.8 (12)	64.8 (8)
Medium mammal	N	-	-	2 (2)	12 (6)	19 (6)	2 (+)	20 (8)	2 (11)	57 (5)
	Weight	-	-	0.2 (+)	1.4 (1)	4.4 (2)	0.2 (+)	4.2 (2)	0.3 (5)	10.7 (1)
Small to medium mammal	N	-	5 (31)	9 (11)	14 (7)	22 (7)	24 (8)	8 (3)	-	82 (7)
	Weight	-	0.3 (3)	0.5 (+)	6.1 (5)	1.4 (+)	2.2 (2)	0.5 (+)	-	11.0 (1)
Small mammal	N	-	1 (6)	6 (7)	53 (27)	45 (14)	108 (37)	15 (6)	1 (6)	229 (20)
	Weight	-	0.1 (+)	0.7 (+)	3.5 (3)	2.2 (1)	4.1 (3)	1.7 (+)	0.1 (2)	12.4 (2)
Egg shell	N	-	-	-	-	6 (2)	4 (1)	-	-	10 (+)
	Weight	-	-	-	-	0 -	0 -	-	-	0 -
Mussel shell	N	-	1 (6)	-	2 (1)	2 (+)	3 (1)	2 (+)	-	10 (+)
	Weight	-	4.8 (50)	-	0.4 (+)	1.2 (+)	1.0 (+)	19.6 (10)	-	27.0 (3)
Total	N	1	16	84	197	314	290	239	18	1159
	Weight	0.5	9.7	136.1	124.4	197.2	138.3	189.1	6.6	801.9

Key: ( ) = % of column total
+ = Less than 1%

Table 5. Counts and frequencies of faunal specimens by sized taxonomic groups, Taliaferro site.

Taxonomic Group	Component								Total
	I	II	III	IV	V	VI	VII	VIII	
Identified large animals	-	-	22	20	35	24	42	-	143
% Column Subtotal	-	-	100	50	67	30	78	-	56
% Column Total	-	-	26	10	11	9	18	-	13
Identified small animals	-	-	-	20	17	57	12	5	111
% Column Subtotal	-	-	-	50	33	70	22	100	44
% Column Total	-	-	-	10	6	20	5	28	10
Identified taxa Subtotal	-	-	22	40	52	81	54	5	254
% Column Total	-	-	26	20	17	29	23	28	22
Unidentified large animals	1	9	47	88	187	70	160	12	574
% Column Subtotal	100	60	76	57	74	35	87	92	65
% Column Total	100	60	56	45	61	25	68	67	50
Unidentified small animals	-	6	15	67	67	132	23	1	311
% Column Subtotal	-	40	24	43	26	65	13	8	35
% Column Total	-	40	18	34	22	47	10	6	27
Unidentified taxa Subtotal	1	15	62	155	254	202	183	13	885
% Column Total	100	100	74	79	83	71	77	72	78
Total	1	15	84	195	306	283	237	18	1139

of the combined taxa as a basis for much of the following discussion. Because of their different nature, specimens of egg and mussel shell are deleted from Table 5. In this table, all artiodactyls and large, medium to large, and medium mammals are regarded as large animals and all other taxa as small animals.

Except for mussel and sage grouse, each of these taxa is represented by a minimum number of one to two individuals in the various cultural components (Table 6). Because mussel is represented mainly by small shell fragments, MNIs were not calculated. However, Components II and VII each contain one hinge fragment, representing at least one individual in each of these components. In the case of sage grouse, Component VI contains a minimum number of three individuals, represented by one male and two females. Two other taxa were identified to the level of order: Artiodactyl and Lagomorph. Minimum number of individuals (MNI) was not calculated for the less specific taxa because these groups may be composed of specimens representing the MNIs for the identified taxa.

Specimens of unidentified taxa make up 78% of the entire sample. This high frequency may be attributed partially to the relatively poor preservation

Table 6. Minimum number of individuals (MNI) for identified taxa, Taliaferro site.

Taxon	Component I	II	III	IV	V	VI	VII	VIII
Bison	-	-	1	1	-	-	1	-
Mule deer	-	-	-	-	1	1	1	-
Pronghorn	-	-	1	1	2	2	2	-
Jackrabbit	-	-	-	2	2	1	2	-
Cottontail	-	-	-	1	1	1	1	-
Muskrat	-	-	-	1	-	1	-	-
Prairie dog	-	-	-	-	-	1	-	-
Ground squirrel	-	-	-	1	-	1	-	-
Vole	-	-	-	1	-	-	-	-
Sage grouse	-	-	-	1	1	3	-	-
Fish (sucker)	-	-	-	1	-	1	-	-

of many of the specimens, as mentioned above, and to the highly fragmented nature of most of the sample, discussed below. In the following discussion of the different taxonomic groups, consideration of frequencies of unidentified taxa will be incorporated to increase the interpretive value of the smaller frequencies of identified taxa.

The combined artiodactyl taxa comprise 13% of the entire sample and 56% of all identified taxa. Similar frequencies of artiodactyls are present in all components in which they are represented, except in Component VI. In unidentified taxa, the large animals constitute 50% of the entire sample and 65% of all unidentified taxa. Generally these higher frequencies of identified and unidentified large animals indicate a greater emphasis on large game in all components except Component VI. This component contains the largest amount of specimens of identified small animals, which combine to make up 70% of all identified taxa in Component VI. Likewise, unidentified small animals in Component VI comprise 65% of all unidentified taxa, suggesting a decreased importance of large game in favor of a more varied faunal subsistence base during this occupation.

Consideration of the frequencies of specific artiodactyl taxa indicates a dominance of pronghorn in the total sample as well as within each component containing pronghorn. Given the minor representation of mule deer in three of the components, many of the small to medium artiodactyl specimens would probably augment the pronghorn sample, increasing the dominance of this species. In the components where small amounts of bison are present, the smaller artiodactyls are still dominant. The exception is Component III, where a more even representation of bison and pronghorn is apparent, given that the specimens of unspecified artiodactyl are nondiagnostic fragments of tooth enamel.

Among the smaller taxa, specimens of rabbit and bird are dominant, comprising 41% and 32%, respectively, for the entire sample of identified small animals. Rodents and fish make up the remainder in fairly even frequencies (15%, and 12% respectively). The frequencies of these taxa are variable for each of the cultural components. In Components IV, V and VII, rabbits are the dominant small animal, whereas Component VI contains more bird remains (54% of all identified small animals) than rabbits. In all cases, jackrabbit is the main species of lagomorph. In the other components, small animals are poorly represented. In the unidentified taxa for the entire sample, small mammal bones constitute 35%. Generally, the representations of small animals reflect a subsistence in which a variety of species and habitats were exploited during most occupations of the site.

The upland context of the site would yield such large game species as bison, pronghorn, and mule deer. These species are typically found in prehistoric sites (Armatage et al. 1982; Eakin 1985; Frison 1971 and 1973; Harrell and McKern 1986; Hoefer 1986; McGuire 1977) and seem to have been the most common animals exploited by aboriginal populations in the area. Also found in upland contexts are smaller game, like rabbits, sage grouse, prairie dog, ground squirrel, and vole. The latter rodents have been included in the cultural faunal remains because they are burned, as in the case of the ground squirrel and vole, or because the species is not currently inhabiting the site area, as in the case of the prairie dog. It is quite possible that the prairie dog remains are not culturally associated (as may also be true for some of the rabbit remains), especially because most specimens were recovered from the most recent component nearest the surface. Therefore, the prairie dog inclusion in the cultural remains must be considered tentative. However, one specimen of prairie dog was recovered from the Wardell site (Frison 1973:72), as well as the remains of various rabbits and rodent. These were also found at the Eden-Farson (Frison 1971:266) and Skull Point sites (McGuire 1977:12).

The cultural association of the bird and sage grouse remains may also be questionable, although the presence of two burned specimens and their recovery from solid archaeological contexts lends validity to their cultural association. Sage grouse remains have been recovered from Late Prehistoric components at other sites in the vicinity (Armatage et al. 1982; Frison 1971, 1973; Harrell and McKern 1986; Hoefer 1986; Zier 1982) as well as from Archaic occupations in at least one site (Eakin 1985). It is apparent that sage grouse were exploited by prehistoric inhabitants of the area for several thousand years.

Exploitation of animals from lowland, riparian habitats is not so well documented from archaeological contexts in this area. The presence of the remains of muskrat, fish, and mussel in this sample indicates that the site occupants probably traveled at least 7 km to the Green River to acquire these food sources. Although Slate Creek is the nearest permanent water source and it is possible that muskrat and perhaps sucker inhabited its ecozone, it is doubtful that such a small stream would support viable populations of mussels. Freshwater mussels are known to be most abundant in larger rivers and absent from "small creeks and spring brooks" (Pennak 1953:745). Presently, mussels can be found in the Green River in small numbers and diminutive sizes, probably because dam construction has decreased their habitat due to reduced silt flow. Larger populations of freshwater mollusks must have been common in the past, as evidenced by the remains at this site, the Wardell site (Frison 1973:68), and at least two other sites in the area (Armitage et al. 1982:182-184; Schroedl 1985:148). At Wardell, Lampsilis was identified, although this genus is restricted to the Mississippi drainages and eastern United States (Pennak 1953:747). Margaritifera is known to be one of a few genera of mussels found in the Rocky Mountains and drainages entering the Pacific Ocean (Pennak 1953:747).

Fish remains have been recovered from archaeological contexts in the immediate vicinity at the Eden-Farson site (Frison 1971:266) and at the Skull Point site (McGuire 1977:13). At both sites, trout (Salmo sp.) was identified from Protohistoric components. Regionally, fish remains, including sucker (Catostomus and Moxostoma), chub (Gila and Semotilus), minnow (Cyprinidae), and squawfish (Ptychocheilus locius), were recovered from Fremont and Late Prehistoric components at sites in northeastern Utah (Aikens 1967:55) and northwestern Colorado (Arthur et al. 1985; LaPoint et al. 1981; and Price 1978:47).

Generally, the taxa represented in the faunal remains from the Taliaferro site indicate that a wide variety of animals was procured from various environments near the site. Big game animals, like artiodactyls, dominated the diet, which was supplemented by several smaller species during most of the occupations. The exception is Component VI, where a greater reliance on a wide variety of small animals is apparent.

Anatomical Elements

Tables 7-10 present the data collected for anatomical element, side of body, and portion of element for all the faunal remains. Also incorporated in the tables are other data, i.e., burned specimens and age of immature specimens, to give more detail. For ease in tabular presentation, the data are separated into tables grouped by broad taxonomic categories: artiodactyls, identified small mammals, nonmammalian taxa, and unidentified taxa. Each of these groups is discussed below with attention to interpretations derived from the data on anatomical elements.

For the artiodactyls, frequencies of skeletal portions were calculated by excluding tooth enamel, which makes up 24% of all artiodactyl specimens and is of little interpretive value because one individual may produce hundreds of enamel fragments. Cranial elements are represented primarily by tooth crown fragments, which make up 18%, while specimens of the axial skeleton constitute 17%. Limb bones comprise 64% of the artiodactyl specimens with front, hind, and indeterminate limbs represented by 16%, 18%, and 30% respectively. Within this sample of limb elements, those of the distal extremities (podials, metapodials, and phalanges) are more abundant, represented by 64%. These frequencies of artiodactyl skeletal portions are generally repeated in the various components and among the specified taxa. They may be interpreted as being indicative of procurement of these animals at off-site loci and subsequent transport to the site of selected body portions, i.e., front and hind quarters and limbs. The selection of these portions may be explained partially by the fact that they carry the greatest concentrations of meat. Just as importantly, the fractured long bones of the limbs provide the greatest quantities of bone marrow. These elements may also be further reduced to small fragments and then boiled to produce nutritious bone juice and grease. Likewise, the smaller, more compact bones of the distal extremities are also suitable and chosen for bone grease/juice production (Binford 1978:160). The minor frequencies of the cranial and axial skeleton

Table 7. Anatomical elements represented in Artiodactyl taxa.

Element / Side of Body / Portion of Element / Orientation	Bison	Mule Deer	Pronghorn	Small to Medium Artiodactyl	Large Artiodactyl	Other Artiodactyl	Total
Component III							
Tooth							
Undetermined							
Enamel	-	-	-	3	-	11	14
Ischium							
Left							
Middle							
Ventral	-	-	1	-	-	-	1
Pubis							
Left							
Middle							
Medial	-	-	-	1	-	-	1
Tibia							
Right							
Articular surface							
Distal	1	-	-	-	-	-	1
Tarsal(2nd & 3rd)							
Left							
Complete	1	-	-	-	-	-	1
Podial							
Undetermined							
Middle	-	-	-	-	1	-	1
Second Phalange							
Undetermined							
Condyle							
Distal	-	-	-	1	-	-	1
Third Phalange							
Undetermined							
Mostly complete							
(proximal absent)	1	-	-	-	-	-	1
Undetermined							
Articular surface							
Proximal	1	-	-	-	-	-	1
Total	4	-	1	5	1	11	22
Component IV							
Molar							
Undetermined							
Crown	1	-	-	-	-	-	1
Tooth							
Undetermined							
Crown	-	-	-	1	-	-	1
Thoracic vetebra							
Right							
Zygopophysis							
Posterior	-	-	-	1	-	-	1
Not applicable							
All							
Anterior	-	-	-	1	-	-	1
Lumbar vertebra							
Left							
Zygopophysis							
Anterior	-	-	-	1	-	-	1

Table 7. Continued.

Element Side of Body Portion of Element Orientation	Bison	Mule Deer	Pronghorn	Small to Medium Artiodactyl	Large Artiodactyl	Other Artiodactyl	Total
			Component IV (continued)				
Humerus							
Left							
Condyle							
Distal	-	-	1	-	-	-	1
Humerus							
Undetermined							
Articular surface							
Proximal	-	-	-	1	-	-	1
Ulna							
Left							
Shaft							
Middle	1	-	-	-	-	-	1
Undetermined							
Shaft							
Middle	-	-	-	(1)	-	-	(1)
Radius							
Left							
Articular surface							
Distal	-	-	-	1	-	-	1
Scaphoid							
Right							
Complete	-	-	1	-	-	-	1
First Phalange							
Undetermined							
Condyle							
Proximal	-	-	-	2	-	-	2
Distal	-	-	1	(1)	-	-	2 (1)
Innominate							
Undetermined							
Acetabulum							
Dorsal	-	-	-	1	-	-	1
Metapodial							
Undetermined							
Epiphysis							
Distal	-	-	-	1J	-	-	1J
Shaft							
Middle	-	-	-	1	-	-	1
Astragalus							
Left							
Complete	-	-	-	1	-	-	1
Tarsal (2nd & 3rd)							
Left							
Complete	-	-	-	1	-	-	1
Total	2	-	3	15 (2)	-	-	20 (2)
			Component V				
Tooth							
Undetermined							
Enamel	-	-	-	3 (1)	-	2	5 (1)
Vertebra							
Not applicable							
Neural arch	-	-	-	1F	-	-	1F

Table 7. Continued.

Element Side of Body Portion of Element Orientation	Bison	Mule Deer	Pronghorn	Small to Medium Artiodactyl	Large Artiodactyl	Other Artiodactyl	Total
				Component V (continued)			
Cervical vertebra							
Right							
Zygopophysis							
Anterior	-	-	-	(1)	-	-	(1)
Not applicable							
Centrum	-	-	-	1F	-	-	1F
Sacrum							
Right							
All							
Middle/Dorsal	-	-	-	1	-	-	1
Proximal/Anterior	-	-	-	1	-	-	1
Rib							
Undetermined							
Articular surface							
Proximal	-	-	-	1	-	-	1
Sternal rib							
Undetermined							
Body							
Middle	-	-	-	3	-	-	3
Humerus							
Right							
Shaft							
Distal/Posterior	-	-	-	2	-	-	2
Undetermined							
Articular surface							
Proximal	-	-	-	(1)	-	-	(1)
Radius							
Left							
Articular surface							
Proximal	-	-	-	1	-	-	1
Pisiform							
Left							
Complete	-	-	(1)	-	-	-	(1)
Metacarpal							
Undetermined							
Shaft							
Middle/Posterior	-	-	-	1	-	-	1
Sesamoid							
Undetermined							
Complete	-	-	-	1	-	-	1
First Phalange							
Undetermined							
Condyle							
Distal/Ventral	-	-	-	2 (1)	-	-	2 (1)
Second Phalange							
Undetermined							
Condyle							
Distal	-	-	-	1	-	-	1
Ischium							
Left							
Acetabulum	-	-	-	1	-	-	1
Body							
Middle/Posterior	-	1	-	-	-	-	1

Table 7. Continued.

Element Side of Body Portion of Element Orientation	Bison	Mule Deer	Pronghorn	Small to Medium Artiodactyl	Large Artiodactyl	Other Artiodactyl	Total
				Component V (continued)			
Pubis							
Right							
Body							
Middle/Ventral	-	-	-	1	-	-	1
Tibia							
Left							
Shaft							
Distal/Anterior	-	-	-	2	-	-	2
Right							
Shaft							
Distal/Medial	-	-	-	(1)	-	-	(1)
Metapodial							
Undetermined							
Epiphysis and Shaft							
Distal	-	-	-	2J	-	-	2J
Shaft							
Distal	-	-	-	1J	-	-	1J
Middle/Posterior	-	-	-	1	-	-	1
Calcaneus							
Left							
Body							
Posterior	-	-	1F	-	-	-	1F
Total	-	1	2 (1)	30 (5)	-	2	35 (6)
				Component VI			
Tooth							
Undetermined							
Crown	-	-	-	1	-	-	1
Enamel	-	-	-	12	-	-	12
Atlas							
Not applicable							
All							
Anterior/Ventral	-	-	1	-	-	-	1
Right							
Neural arch							
Posterior	-	-	1	-	-	-	1
Rib							
Undetermined							
Articular surface							
Proximal	-	-	-	1	-	-	1
Humerus							
Left							
Condyle							
Distal/Medial	-	-	-	(1)	-	-	(1)
Radius							
Right							
Shaft							
Distal/Posterior	-	-	1	-	-	-	1
Metacarpal							
Left							
Articular surface							
Proximal/Posterior/ Medial	-	-	-	(1J)	-	-	(1J)

Table 7. Continued.

Element Side of Body Portion of Element Orientation	Bison	Mule Deer	Pronghorn	Small to Medium Artiodactyl	Large Artiodactyl	Other Artiodactyl	Total
				Component VI (continued)			
Tibia							
Left							
Shaft							
Proximal/Posterior/ Lateral	-	-	-	(1)	-	-	(1)
Metatarsal							
Right							
Mostly complete (distal absent)	-	-	1	-	-	-	1
Undetermined							
Shaft							
Middle/Anterior	-	-	-	1	-	-	1
First Phalange							
Undetermined							
Complete	-	-	1J	-	-	-	1J
First Phalange							
Undetermined							
Half of All							
Medial or Lateral	-	1	-	-	-	-	1
Total	-	1	5	18 (3)	-	-	24 (3)
				Component VII			
Occipital							
Not applicable							
Margin							
Posterior/Dorsal	-	-	-	1	-	-	1
Sphenoid							
Not applicable							
Body							
Middle	-	-	1J	-	-	-	1J
Tooth							
Undetermined							
Crown	-	-	16	-	-	-	16
Enamel	-	-	-	2	-	-	2
Thoracic vertebra							
Not applicable							
Centrum	-	-	-	2J	-	-	2J
Spine							
Proximal	-	-	-	1	-	-	1
Rib							
Undetermined							
Body							
Middle	-	-	-	1	-	-	1
Humerus							
Left							
Shaft							
Middle/Posterior	-	-	-	(1)	-	-	(1)
Right							
Condyle							
Distal	-	-	-	1	-	-	1

Table 7. Concluded.

Element Side of Body Portion of Element Orientation	Bison	Mule Deer	Pronghorn	Small to Medium Artiodactyl	Large Artiodactyl	Other Artiodactyl	Total
Component VII (continued)							
First Phalange							
Undetermined							
Condyle							
Distal	-	-	1	-	-	-	1
Second Phalange							
Undetermined							
Complete	-	-	1	-	-	-	1
Condyle							
Proximal/Anterior	-	-	-	1	-	-	1
Third Phalange							
Undetermined							
Complete	-	-	1	-	-	-	1
Body							
Dorsal	1	-	-	-	-	-	1
Pubis							
Left							
Complete	-	-	1F	-	-	-	1F
Right							
Acatabulum	-	1	-	-	-	-	1
Metatarsal							
Undetermined							
Shaft							
Middle/Anterior	-	-	-	(1)	-	-	(1)
Metapodial							
Undetermined							
Condyle							
Distal	-	-	-	7 (2)	-	-	7 (2)
Shaft							
Middle	-	-	-	-	1	-	1
Total	1	1	21	18 (4)	1	-	42 (4)

Key: N = Number of specimens
(N) = Number of burned specimens
F = Fetal/Infant (bone poorly developed, epiphyses unfused)
J = Juvenile (bone well developed, epiphyses unfused)

indicate that at times, some parts of the head and trunk of the smaller artiodactyls were also brought to the site along with the more common limb portions.

Frequencies of anatomical elements represented in the smaller animals also show higher proportions of limb bones. It seems unlikely that only the limbs of such small animals would be selectively transported to the site. A more plausible explanation of these higher frequencies of limb elements of small animals is that the shafts and articular ends of the long bones would be preserved identifiably. The more fragile bones of the cranium and spinal column would more likely be crushed beyond recognition as a result of processing, disposal, and subsequent trampling and/or burning. This may also explain some of this same pattern in the larger animals, although their more massive bones would be less likely to be fragmented beyond recognition except through direct human manipulation.

Table 8. Anatomical elements represented in identified small mammal taxa, Taliaferro site.

Element Side of Body Portion of Element Orientation	Jackrabbit	Cottontail	Unspecified Rabbit	Muskrat	Prairie Dog	Ground Squirrel	Vole	Total
			Component IV					
Mandible								
Left								
Horizontal ramus	-	-	-	-	-	-	(1)	(1)
Maxilla								
Left								
Middle	-	-	-	-	-	(1)	-	(1)
Frontal								
Left								
Orbital	(1)	-	-	-	-	-	-	(1)
Temporal								
Right								
Petrous process	1	-	-	-	-	-	-	1
Thoracic vertebra								
Right								
Zygopophysis								
Posterior	(1)	-	-	-	-	-	-	(1)
Scapula								
Left								
Glenoid fossa	-	-	-	(1)	-	-	-	(1)
Humerus								
Right								
Condyle								
Distal	(1)	-	-	-	-	-	-	(1)
Shaft								
Distal	-	(1)	-	-	-	-	-	(1)
Undetermined								
Shaft								
Middle	(1)	-	-	-	-	-	-	(1)
Ulna								
Left								
Articular surface								
Proximal	1	-	-	-	-	-	-	1
Right								
Articular surface								
Proximal	-	-	-	1	-	-	-	1
Second Phalange								
Undetermined								
Complete	1	-	-	-	-	-	-	1
Femur								
Right								
Condyle								
Distal	(1J)	-	-	-	-	-	-	(1J)
Shaft								
Proximal/Posterior	2	-	-	-	-	-	-	2
Tibia								
Right								
Epiphysis								
Proximal	1J	-	-	-	-	-	-	1J
Shaft								
Proximal/Posterior	1	-	-	-	-	-	-	1
Distal/Medial	1	-	-	-	-	-	-	1
Total	13 (5)	(1)	-	2 (1)	-	(1)	(1)	18 (9)

Table 8. Continued.

Element Side of Body Portion of Element Orientation	Jackrabbit	Cottontail	Unspecified Rabbit	Muskrat	Prairie Dog	Ground Squirrel	Vole	Total
				Component V				
Mandible								
Left								
Ascending ramus								
Posterior	1	-	-	-	-	-	-	1
Frontal								
Left								
Middle	1	-	-	-	-	-	-	1
Temporal								
Left								
Zygomatic process	-	(1)	-	-	-	-	-	(1)
Radius								
Right								
Articular surface								
Proximal	1	-	-	-	-	-	-	1
Distal	(1)	-	-	-	-	-	-	(1)
Pubis								
Left								
Body								
Middle	(1)	-	-	-	-	-	-	(1)
Femur								
Left								
Shaft								
Middle/Lateral	(1)	-	-	-	-	-	-	(1)
Right								
Epiphysis								
Proximal	1J	-	-	-	-	-	-	1J
Shaft								
Proximal	1	-	-	-	-	-	-	1
Middle/Posterior	1	-	-	-	-	-	-	1
Tibia								
Left								
Articular surface								
Distal/Anterior/ Medial	(1)	-	-	-	-	-	-	(1)
Proximal/Posterior/ Lateral	-	1	-	-	-	-	-	1
Shaft								
Proximal/Lateral	1	-	-	-	-	-	-	1
Metatarsal								
Undetermined								
Articular surface								
Proximal	1	-	-	-	-	-	-	1
Total	12 (4)	2 (1)	-	-	-	-	-	14 (5)
				Component VI				
Mandible								
Left								
Horizontal ramus	1	-	-	-	-	-	-	1
Scapula								
Left								
Glenoid fossa	(1)	-	-	-	-	-	-	(1)
Humerus								
Left								
Condyle								
Distal	-	-	-	-	1	-	-	1

Table 8. Continued.

Element Side of Body Portion of Element Orientation	Jackrabbit	Cottontail	Unspecified Rabbit	Muskrat	Prairie Dog	Ground Squirrel	Vole	Total
			Component VI (continued)					
Ulna								
Undetermined								
Shaft								
Middle	-	-	(1)	-	-	-	-	(1)
Metacarpal								
Undetermined								
Articular surface and shaft								
Proximal	1	-	-	-	-	-	-	1
Innominate								
Left								
Mostly complete (Posterior absent)	-	-	-	1J	-	-	-	1J
Right								
Acetabulum and body								
Posterior	-	-	-	1J	-	-	-	1J
Ischium								
Left								
Complete	-	-	-	-	-	(1)	-	(1)
Iliac								
Right								
Acetabulum and body								
Middle	-	-	-	-	1	-	-	1
Femur								
Left								
Complete	-	-	-	1J	-	-	-	1J
Right								
Mostly complete (Lateral, distal epiphysis absent)	-	-	-	1J	-	-	-	1J
Articular surface								
Proximal	-	1	-	-	-	-	-	1
Calcaneus								
Left								
Complete	-	-	-	1J	-	-	-	1J
Articular surface								
Proximal	-	1	-	-	-	-	-	1
Total	3 (1)	2	(1)	5	2	(1)	-	14 (3)
			Component VII					
Thoracic vertebra								
Not applicable								
Complete	1	-	-	-	-	-	-	1
Humerus								
Left								
Condyle								
Distal	1	-	-	-	-	-	-	1
Epiphysis								
Proximal	1J	-	-	-	-	-	-	1J
Ulna								
Left								
Articular surface								
Proximal/Lateral	-	(1)	-	-	-	-	-	(1)

Table 8. Concluded.

Element Side of Body Portion of Element Orientation	Jackrabbit	Cottontail	Unspecified Rabbit	Muskrat	Prairie Dog	Ground Squirrel	Vole	Total
				Component VII (continued)				
Right								
Olecranon process								
Proximal/Posterior	1	-	-	-	-	-	-	1
Shaft								
Proximal/Posterior	1	-	-	-	-	-	-	1
Tibia								
Left								
Shaft								
Middle/Posterior/ Lateral	-	1	-	-	-	-	-	1
Right								
Shaft								
Middle/Anterior	-	(1)	-	-	-	-	-	(1)
Metatarsal								
Undetermined								
Articular surface								
Proximal	1	-	-	-	-	-	-	1
Metapodial								
Undetermined								
Articular surface								
Proximal	-	-	(1)	-	-	-	-	(1)
Calcaneus								
Right								
Body								
Posterior	2 (1)	-	-	-	-	-	-	2 (1)
Total	8 (1)	3 (2)	(1)	-	-	-	-	12 (4)
				Component VIII				
Mandible								
Right								
Horizontal ramus								
Anterior	-	-	-	-	1	-	-	1
Ulna								
Right								
Articular surface and shaft								
Proximal	-	-	-	-	1	-	-	1
Radius								
Right								
Articular surface and shaft								
Proximal	-	-	-	-	1	-	-	1
Ilium								
Left								
Body								
Anterior	-	-	-	-	1	-	-	1
Tibia								
Right								
Articular surface and shaft								
Distal	-	-	-	-	1	-	-	1
Total	-	-	-	-	5	-	-	5

Key: N = Number of specimens
(N) = Number of burned specimens
J = Juvenile (bone well developed, epiphyses unfused)

Table 9. Anatomical elements represented in non-mammalian taxa, Taliaferro site.

Element Side of Body Portion of Element Orientation	Sage Grouse	Unspecified Bird	Fish (Sucker)	Mussel	Total
		Component II			
Bivalve shell	-	-	-	1	1
Total	-	-	-	1	1
		Component IV			
Vertebra					
Not applicable					
Spine					
Proximal	-	-	1	-	1
Ulna					
Right					
Shaft					
Middle	1	-	-	-	1
Bivalve Shell	-	-	-	2	2
Total	1	-	1	2	4
		Component V			
Vertebra					
Not applicable					
Centrum					
Posterior	-	1	-	-	1
Ulna					
Right					
Shaft					
Middle	1	-	-	-	1
Radius					
Right					
Articular surface and shaft					
Proximal-middle	1	-	-	-	1
Egg shell	-	6	-	-	6
Bivalve shell	-	-	-	2	2
Total	2	7	-	2	11
		Component VI			
Maxilla					
Right					
Pharyngeal teeth					
Posterior/Medial	-	-	1	-	1
Angular					
Left					
Articular surface					
Posterior	-	-	1	-	1
Sphenotic					
Right					
Complete	-	-	1	-	1
Interopercle					
Left					
Complete	-	-	1	-	1
Cleithrum					
Undetermined					
Complete	-	-	1	-	1

Table 9. Continued.

Element Side of Body Portion of Element Orientation	Sage Grouse	Unspecified Bird	Fish (Sucker)	Mussel	Total
		Component VI (continued)			
Basiterigium					
Right					
Complete	-	-	1	-	1
Cranium					
Undetermined					
Unidentified fragments	-	-	6	-	6
Cervical vertebra					
Not applicable					
Centrum					
Middle	1	-	-	-	1
Lumbar vertebra					
Not applicable					
Centrum and articular surface					
Posterior	1	-	-	-	1
Rib					
Undetermined					
Body					
Distal	-	1	-	-	1
Scapula					
Right					
Glenoid facet	1	-	-	-	1
Glenoid facet and blade	1	-	-	-	1
Blade					
Middle	-	(1)	-	-	(1)
Humerus					
Right					
Articular surface					
Proximal	1	-	-	-	1
Distal	1	-	-	-	1
Articular surface and shaft					
Distal	1	-	-	-	1
Ulna					
Left					
Articular surface					
Proximal	1	-	-	-	1
Right					
Articualr surface					
Proximal	1	-	-	-	1
Shaft					
Middle	1	-	-	-	1
Femur					
Left					
Articular surface					
Proximal	1	-	-	-	1
Right					
Condyle					
Distal	1	-	-	-	1
Distal/Lateral	1	-	-	-	1
Shaft					
Distal/Lateral	1	-	-	-	1
Tibiotarsus					
Right					
Anticular surface					
Proximal/Posterior/Lateral	1	-	-	-	1
Condyle					
Distal	1	-	-	-	1

Table 9. Concluded.

Element Side of Body Portion of Element Orientation	Sage Grouse	Unspecified Bird	Fish (Sucker)	Mussel	Total
		Component VI (continued)			
Tarsometatarsus					
Right					
Articular surface and shaft					
Proximal/Anterior	1	-	-	-	1
First Phalange					
Undetermined					
Articular surface					
Proximal	1	-	-	-	1
Phalange (undetermined)					
Undetermined					
Complete	-	3	-	-	3
Long bone shaft fragment	-	7	-	-	7
Unidentifiable fragment	-	1	-	-	1
Egg shell	-	4 (1)	-	-	4 (1)
Bivalve shell	-	-	-	3	3
Total	18	17 (2)	12	3	50 (2)
		Component VII			
Bivalve shell	-	-	-	2	2
Total	-	-	-	2	2

Key: N = Number of specimens
(N) = Number of burned specimens

Fragment Size

Almost all (98%) of the faunal remains are represented by fragments of bones. In Figure 1, the general category of Large Animals includes bison, mule deer, pronghorn, unspecified artiodactyls, and large, medium to large, and medium mammals. Small Animals refers to all other identified and unidentified taxa. The majority (86%) of the fragments are less than 3 cm in maximum dimension, and the greatest frequency (47%) of fragment size is in the range of 1-2 cm (Figure 1). This pattern is reflected in the specimens of artiodactyl, identified small animals, and unidentified large mammals, with two-thirds to four-fifths of the fragments being less than 3 cm and about one-half being in the range of 1-2 cm. For the unidentified small animals, 97% are less than 3 cm and 44% are in the range of 0.5-1 cm. These proportions are not surprising for these diminutive, unidentifiable specimens.

The majority (67%) of the complete elements in the sample are represented by the small compact bones of the distal extremities of the limbs. In the artiodactyls and larger unidentified mammals, all complete elements are podials, phalanges, and a sesamoid with the exception of one pubis from a

Table 10. Anatomical elements represented in unidentified taxa.

Element	Small Mammal	Small to Medium Mammal	Medium Mammal	Medium to Large Mammal	Large Mammal	Total
Component I						
Bone wall	-	-	-	-	(1)	(1)
Total	-	-	-	-	(1)	(1)
Component II						
Long bone shaft	(1)	-	-	-	-	(1)
Bone wall	-	5	-	2	6 (2)	13 (2)
Unidentified	-	-	-	1	-	1
Total	(1)	5	-	3	6 (2)	15 (3)
Component III						
Long bone shaft	4 (3)	-	-	-	1	5 (3)
Bone wall	2	9 (3)	2	19 (4)	20 (7)	52 (14)
Cancellous tissue	-	-	-	(1)	-	(1)
Unidentified	-	-	-	3 (1)	1	4 (1)
Total	6 (3)	9 (3)	2	23 (6)	22 (7)	62 (19)
Component IV						
Vertebra fragment	-	1	-	-	-	1
Rib body	1	-	-	1	4	6
Humerus shaft	-	1	-	-	-	1
Ulna shaft	-	(1)	-	-	-	(1)
Long bone shaft	29 (12)	-	(1)	4 (2)	9 (3)	43 (18)
Bone wall	13 (4)	11 (3)	6 (2)	24 (5)	18 (3)	72 (17)
Cancellous tissue	-	-	4 (3)	1	6	11 (3)
Unidentified	10 (2)	-	(1)	6 (1)	3	20 (4)
Total	53 (18)	14 (4)	12 (7)	36 (8)	40 (6)	155 (43)
Component V						
Tooth fragment	-	-	-	1	-	1
Tooth enamel	-	-	-	1	-	1
Cervical vertebra fragment	-	-	-	1	-	1
Vertebra fragment	-	-	-	2	-	2
Rib body	5	-	(1)	3	-	9 (1)
Scapula body	-	-	-	-	1	1
Tibia shaft	1	-	-	-	-	1
Podial	-	-	1	-	-	1
Long bone shaft	19 (12)	-	2	2	22 (4)	45 (16)
Bone wall	14 (6)	18 (10)	9 (2)	44 (10)	71 (12)	156 (40)
Cancellous tissue	2	2 (1)	-	11 (2)	3 (1)	18 (4)
Unidentified	4	2 (1)	6	(1)	5	18 (2)
Total	45 (18)	22 (12)	19 (3)	66 (13)	102 (17)	254 (63)
Component VI						
Tooth fragment	-	3	-	-	-	3
Lumbar vertebra fragment	3	-	-	-	-	3
Thoracic vertebra	1	-	-	-	-	1

Table 10. Concluded.

Element	Small Mammal	Small to Medium Mammal	Medium Mammal	Medium to Large Mammal	Large Mammal	Total
			Component VI (continued)			
Rib body fragment	5 (1)	-	-	1	4	10 (1)
Iliac body fragment	1	-	-	-	-	1
Phalange (undetermined)	3	-	-	-	-	3
Third Phalange	(1)	-	-	-	-	(1)
Podial fragment	1	-	-	1	-	2
Long bone shaft	37 (17)	1J	-	1	4 (1)	43 (18)
Bone wall	48 (7)	14 (3)	2	37 (4)	16 (1)	117 (15)
Cancellous tissue	-	1	-	2 (1)	-	3 (1)
Unidentified	8 (1)	5	-	2	-	15 (1)
Total	108 (27)	24 (3)	2	44 (5)	24 (2)	202 (37)
			Component VII			
Tooth fragment					1	1
Rib body fragment	2	-	(1)	-	3	6 (1)
Long bone shaft	9 (6)	-	2 (1)	-	13 (3)	24 (10)
Bone wall	2	6 (3)	17 (2)	59 (10)	43 (10)	127 (25)
Cancellous tissue	-	1	-	10	-	11
Unidentified	2	1	-	7 (1)	4	14 (1)
Total	15 (6)	8 (3)	20 (4)	76 (11)	64 (13)	183 (37)
			Component VIII			
Long bone shaft	-	-	-	-	2	2
Bone wall	1	-	2 (1)	3 (1)	5 (2)	11 (4)
Total	1	-	2 (1)	3 (1)	7 (2)	13 (4)

Key: N = Number of specimens
(N) = Number of burned specimens

fetal pronghorn. Similarly, in the identified and unidentified small animals, one-half of the complete elements are phalanges and a calcaneus. The other half is represented by various elements of the cranial, axial, and appendicular skeleton of various taxa.

Generally, the highly fragmented nature of this faunal sample reflects methods of processing and/or disposal of the remains, particularly for artiodactyls and larger mammals. With consideration of other lines of evidence, such as association with features and presence of cultural modifications, the patterns and frequencies of fragment sizes suggest that the animals were being optimally utilized for their maximum nutritional value. The degree of fragmentation of the bone elements suggests reduction for bone grease/juice processing, especially in the case of the larger animals (Binford 1978; Vehik 1977).

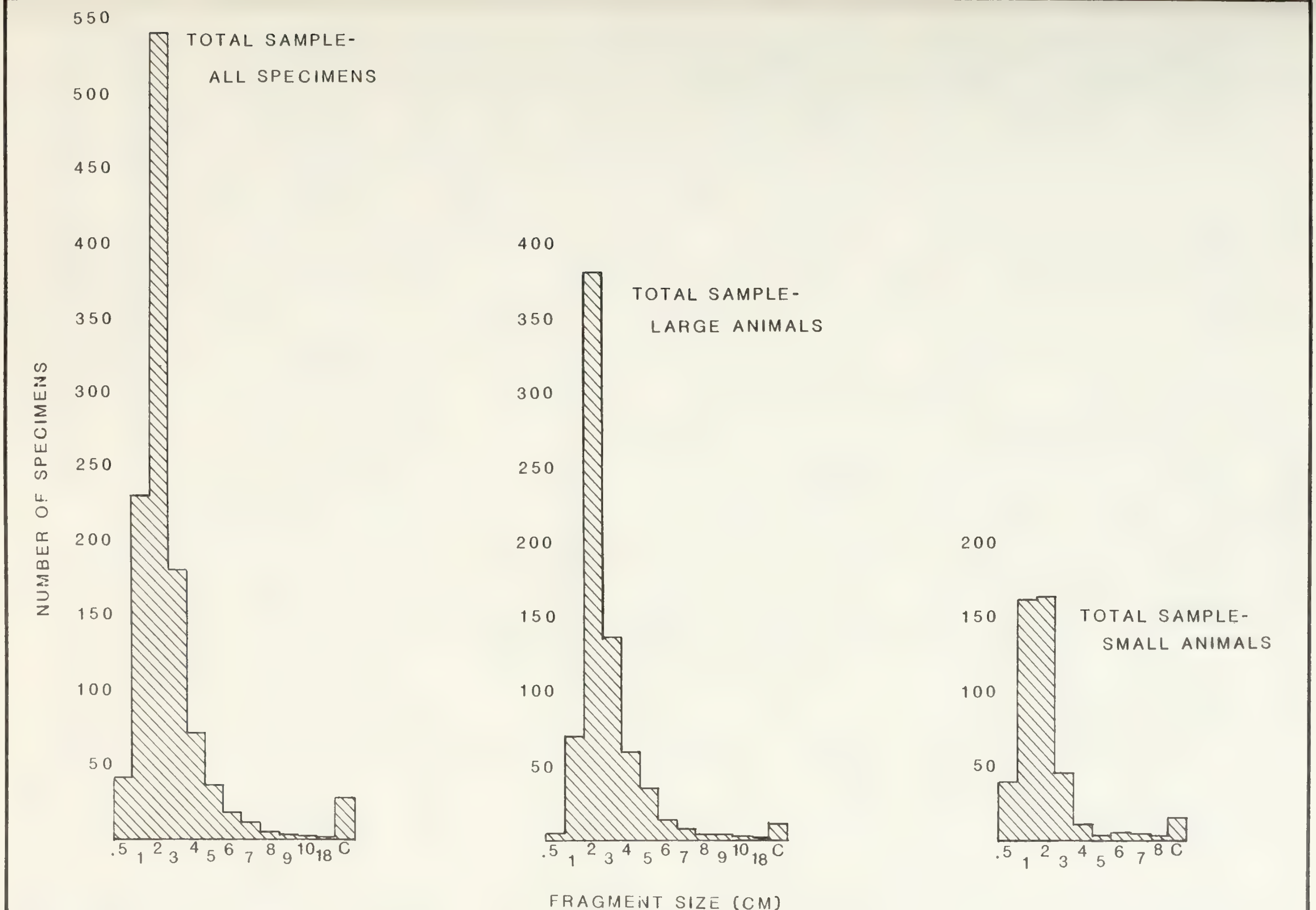


Figure 1. Histograms of fragment sizes for all faunal remains recovered from the Taliaferro site. C indicates complete or whole anatomical elements.

Seasonality

Evidence for season of occupation in some components is reflected in several aspects of their faunal remains: (1) fetal/infant artiodactyl remains; (2) bird egg shell; and (3) fish and mollusk remains. In Component V, one fetal to infant pronghorn is represented by a calcaneus. The two vertebra fragments from a small to medium artiodactyl of the same age probably are from the same individual (Table 7). In Component VII, one fetal to infant pronghorn is represented by a pubis. Other remains of these young individuals may be present in the unidentifiable fragments. The degree of development of the fetal specimens suggests that they died shortly before they would have been born or slightly after they were born. The peak birthing season for pronghorn is in the first week of June (Gilbert 1980:107). Therefore, these individuals could have been procured as fetuses with their mothers as early as the first of May or as infants up to about the middle of June. So at least one occupation during each of Components V and VII times occurred during these months which, in the site area, represents spring time.

Another seasonal indicator is represented in the ten fragments of bird egg shell recovered from Components V and VI, which also contain skeletal remains of sage grouse and unspecified bird. Most likely, most of these avian remains represent sage grouse. The egg shell provides evidence that eggs were collected as part of the subsistence base. This activity must have taken place during the months of April and May, before sage grouse eggs normally hatch (U.S. Department of Interior 1985:55). In Component VI, one male and two female sage grouse are represented, which may indicate a slightly earlier season of collection, because the two sexes congregate on strutting grounds as early as late February (Johnsgard 1973:164). However, both sexes may be present in the area year round, so this cannot be considered as a definitive seasonal indicator. Based on the presence of egg shell in Components V and VI, a late winter to spring occupation is suggested, which coincides with the season indicated by fetal artiodactyl remains from Component V.

The presence of fish bones provides additional evidence for a broader range of season of occupation for Components IV and VI, as do the fragments of shell from freshwater mussel in Components II, IV, V, VI, and VII. Normally these aquatic resources would be available for feasible collection in late spring, summer, and early fall when rivers are free of ice, although fish may be obtained year round. Freshwater mollusks will hibernate by burrowing deeply into silts at an average critical temperature of about -12°C (Pennak 1953:746), which would make them difficult to collect during the winter.

Generally, the limited evidence in the faunal remains suggests spring through fall occupations for five of the cultural components. The more specific evidence in the fetal artiodactyl remains and egg shell indicates late winter to spring occupations with a broader range of spring through fall suggested in the fish and mollusk remains.

Cultural Modifications

About one-third (36%) of all the faunal sample exhibits evidence of cultural modification. The types of modification are burning, spiral fractures, cut marks, and bead production. As mentioned above, the two bead specimens are described in Appendix B and have not been included with the other faunal remains. Each of the other types of cultural modification is discussed below.

Some degree of burning is evident in 21% of the specimens (Table 11). Within this proportion of burned bone, 22% is slightly burned, 38% is completely burned, 27% is slightly calcined, and 13% is completely calcined. The majority (85%) of the burned bone consists of small, unclassifiable fragments. Classifiable burned specimens include pronghorn, small to medium artiodactyl, jackrabbit, cottontail, unspecified rabbit, muskrat, ground squirrel, vole, sage grouse and unspecified bird egg shell. In all artiodactyl remains, only 11% is burned, and a similarly small proportion (19%) of the combined medium, medium to large, and large mammal specimens is burned. Likewise, in all identified small animal remains, only 18% is burned, whereas the combined small and small to medium mammals show the highest percentage (32%) of burned specimens. Generally the proportions of burned bone reflect practices of processing and/or disposal of the faunal remains. Specifically, the low frequencies of burned remains suggest that it was not a common practice to expose bone directly to a source of heat for either processing or disposal. This interpretation is also reflected in the relative proportions of degree of burning in the specimens, which are concentrated toward the lesser degrees.

Evidence of spiral fractures is present on only 14% of the total faunal sample (Table 12). The larger mammals show higher proportions of spirally fractured bone than do the small animals. For artiodactyls and medium to large and large mammals combined, 19% is spirally fractured, while only 5% of all other small animals combined show spiral fractures. These higher frequencies of spiral fracturing in larger animals may be attributed partially to two factors: (1) the thicker long bone walls tend to fracture in this way, as spiral fracturing was originally defined in bones of larger animals (Dart 1959); and (2) long bones of larger animals would more likely be broken by percussion fracturing to remove marrow. Although the compact bone walls of smaller animals do show the remains of spiral fractures, it is more likely that these were produced by incidental crushing during or after consumption of the soft tissue, rather than by intentional green bone breakage to remove the minor concentrations of marrow. Although the frequencies of spirally fractured specimens are significant, especially for the larger mammals, it is possible that the highly fragmented nature of the overall sample may have diminished the proportions, because smaller fragments retain less evidence of spiral fracturing.

Cut marks were observed in less than 1% of the entire faunal sample (Table 12). This low frequency may be a result of the great degree of fragmentation of the specimens in the sample. Most (70%) of the specimens with cut marks are small fragments from unidentified taxa, making interpretations of butchering practices difficult. For the identified taxa, cut marks were observed on a first phalange of a mule deer, a distal condyle of a metapodial from a small to medium artiodactyl, and the proximal end of the shaft of a fifth metatarsal of a jackrabbit. For the artiodactyl specimens, cut marks were probably produced during removal of the soft tissues from the bones. The nature and placement of the cut marks on the jackrabbit metatarsal suggest that they were produced by intentionally cutting the shaft to manufacture a bead. Such a bead was recovered from Component VI (Appendix A), although this specimen was recovered from Component V.

Table 11. Degree of burning represented in faunal remains, Taliaferro site.

Taxon	Slightly Burned N (% Row)	Completely Burned N (% Row)	Slightly Calcined N (% Row)	Completely Calcined N (% Row)	Total N
		Component I			
Large mammal	-	-	-	1 (100)	1
Total	-	-	-	1 (100)	1
		Component II			
Small Mammal	-	-	-	1 (100)	1
Large mammal	-	-	1 (50)	1 (50)	2
Total	-	-	1 (33)	2 (67)	3
		Component III			
Small mammal	1 (100)	-	-	-	1
Small to medium mammal	-	3 (100)	-	-	3
Medium to large mammal	2 (33)	1 (17)	3 (50)	-	6
Large mammal	2 (29)	5 (71)	-	-	7
Total	5 (29)	9 (53)	3 (18)	-	17
		Component IV			
Small to medium Artiodactyl	1 (50)	-	1 (50)	-	2
Jackrabbit	2 (40)	2 (40)	1 (20)	-	5
Cottontail	1 (100)	-	-	-	1
Muskrat	1 (100)	-	-	-	1
Ground squirrel	1 (100)	-	-	-	1
Vole	1 (100)	-	-	-	1
Small mammal	3 (17)	8 (44)	6 (33)	1 (6)	18
Small to medium mammal	1 (25)	2 (50)	1 (25)	-	4
Medium mammal	3 (43)	1 (14)	1 (14)	2 (29)	7
Medium to large mammal	1 (12)	3 (38)	3 (38)	1 (12)	8
Large mammal	1 (17)	5 (83)	-	-	6
Total	16 (30)	21 (39)	13 (24)	4 (7)	54
		Component V			
Pronghorn	-	1 (100)	-	-	1
Small to medium Artiodactyl	1 (20)	1 (20)	2 (40)	1 (20)	5
Jackrabbit	-	2 (50)	-	2 (50)	4
Cottontail	-	1 (100)	-	-	1
Small mammal	1 (6)	10 (56)	4 (22)	3 (17)	18
Small to medium mammal	2 (17)	6 (50)	1 (8)	3 (25)	12
Medium mammal	2 (67)	-	1 (33)	-	3
Medium to large mammal	2 (15)	7 (54)	4 (31)	-	13
Large mammal	4 (24)	4 (24)	6 (35)	3 (18)	17
Total	12 (16)	32 (43)	18 (24)	12 (16)	74
		Component VI			
Small to medium Artiodactyl	3 (100)	-	-	-	3
Jackrabbit	-	-	-	1 (100)	1

Table 11. Concluded.

Taxon	Slightly Burned N (% Row)	Completely Burned N (% Row)	Slightly Calcined N (% Row)	Completely Calcined N (% Row)	Total N
		Component VI (continued)			
Unspecified rabbit	-	-	1 (100)	-	1
Ground squirrel	1 (100)	-	-	-	1
Bird	-	1 (50)	-	1 (50)	2
Small mammal	2 (7)	13 (48)	11 (41)	1 (4)	27
Small to medium mammal	1 (33)	2 (67)	-	-	3
Medium to large mammal	3 (60)	1 (20)	-	1 (20)	5
Large mammal	-	1 (50)	-	1 (50)	2
Total	10 (22)	18 (40)	12 (27)	5 (11)	45
		Component VII			
Small to medium Artiodactyl	1 (25)	3 (75)	-	-	4
Jackrabbit	-	-	1 (100)	-	1
Cottontail	-	-	2 (100)	-	2
Unspecified rabbit	-	-	1 (100)	-	1
Small mammal	2 (33)	1 (17)	1 (17)	2 (33)	6
Small to medium mammal	-	1 (33)	2 (67)	-	3
Medium mammal	-	2 (50)	1 (25)	1 (25)	4
Medium to large mammal	2 (18)	3 (27)	6 (55)	-	11
Large mammal	5 (38)	3 (23)	3 (23)	2 (15)	13
Total	10 (22)	13 (29)	17 (38)	5 (11)	45
		Component VIII			
Medium mammal	-	-	1 (100)	-	1
Medium to large mammal	-	-	1 (100)	-	1
Large mammal	-	1 (50)	-	1 (50)	2
Total	-	1 (25)	2 (50)	1 (25)	4
		All Components Combined			
Total	53 (22)	94 (39)	66 (27)	30 (12)	243

CONCLUSIONS

The sample of faunal remains recovered from the Taliaferro site is fairly small in size, particularly when considered by each cultural component. The small sample size and the high proportions of specimens from unidentified taxa limit the potential for interpretation of cultural behaviors and adaptations. In spite of these limitations, it is still possible to offer some tentative interpretations based on the meager evidence within the faunal remains. Conclusions about each of the components are presented first, followed by a brief discussion of the changes through time in the faunal subsistence base at the Taliaferro site.

Table 12. Cultural modification of faunal remains, Taliaferro site.

Taxon	Spirally Fractured N (%)	Cut Marks N (%)	Total N (%)
	Component II		
Medium to large mammal	-	1 (33)	1 (33)
Total	-	1	1
	Component III		
Bison	1 (25)	-	1 (25)
Pronghorn	1 (100)	-	1 (100)
Small to medium Artiodactyl	1 (20)	-	1 (20)
Small mammal	1 (17)	-	1 (17)
Medium to large mammal	5 (22)	1 (4)	6 (26)
Large mammal	2 (9)	-	2 (9)
Total	11	1	12
	Component IV		
Pronghorn	2 (67)	-	2 (67)
Small to medium Artiodactyl	2 (13)	-	2 (13)
Jackrabbit	4 (31)	-	4 (31)
Small mammal	4 (8)	-	4 (8)
Small to medium mammal	2 (14)	-	2 (14)
Medium to large mammal	3 (8)	-	3 (8)
Large mammal	13 (33)	-	13 (33)
Total	30	-	30
	Component V		
Small to medium Artiodactyl	7 (23)	-	7 (23)
Jackrabbit	3 (25)	1 (8)	4 (33)
Small mammal	2 (4)	-	2 (4)
Medium to large mammal	3 (5)	1 (2)	4 (6)
Large mammal	51 (50)	-	51 (50)
Total	66	2	68
	Component VI		
Mule deer	-	1 (100)	1 (100)
Pronghorn	1 (20)	-	1 (20)
Small to medium Artiodactyl	2 (33)	1 (17)	3 (50)
Unspecified rabbit	1 (100)	-	1 (100)
Bird	4 (11)	-	4 (11)
Medium to large mammal	2 (5)	1 (2)	3 (7)
Large mammal	10 (42)	1 (4)	11 (46)
Total	20	4	24
	Component VII		
Pronghorn	1 (5)	-	1 (5)
Large Artiodactyl	1 (100)	-	1 (100)

Table 12. Concluded.

Taxon	Spirally Fractured N (%)	Cut Marks N (%)	Total N (%)
	Component VII (continued)		
Small to medium Artiodactyl	2 (11)	-	2 (11)
Cottontail	1 (33)	-	1 (33)
Small mammal	1 (7)	-	1 (7)
Small to medium mammal	1 (13)	1 (13)	2 (25)
Medium to large mammal	7 (9)	-	7 (9)
Large mammal	18 (28)	1 (2)	19 (30)
Total	32	2	34
	Component VIII		
Large mammal	1 (14)	-	1 (14)
Total	1	-	1 (14)

Key: N = Number of specimens
(%) = Percent of total number of each taxonomic group within each component

Component I

The one specimen recovered from Component I is not sufficient evidence for deriving interpretations about faunal procurement and processing activities. The specimen simply indicates that a large mammal was procured and at least part of it was brought to the site, where fragmentation and burning of the bone took place. Considering that a total of 102 m² was excavated from Component I, the poor representation of faunal remains recovered from this area suggests that processing of animal resources was not a significant priority during this occupation.

Component II

The 16 specimens from Component II represent unidentified large and small mammals and a freshwater mollusk recovered from a total of 58 m². Although the sample size here is also too small to support conclusive interpretations, these specimens indicate a varied subsistence base which included exploitation of a riparian environment some distance from the site. Apparently, processing and/or disposal of the animal resources involved fragmentation of the bone and, to a lesser extent, burning. The presence of a freshwater mussel suggests that the site was occupied at sometime during spring through fall when these invertebrates would be accessible for collection.

Component III

In Component III, a total of 122 m² of excavation produced 84 specimens representing bison, pronghorn, unspecified artiodactyls, and unidentified taxa of all size grades. Although this too is a relatively small sample size, more can be said about relative importance of specific animals in the subsistence base. During this occupation, bison and pronghorn seem to have been exploited with nearly equal emphasis, and these large game animals dominated the faunal subsistence base. Small animals are represented only in the unidentified taxa, where their numbers suggest that they were relatively unimportant. In the artiodactyls, the represented anatomical elements suggest that only selected portions of the animals were brought to the site. For both bison and pronghorn, these portions seem to have been hind quarters and distal extremities of the limbs. The degree of fragmentation reflects optimal exploitation of the faunal resources for their maximum nutritional value, i.e., bone grease/juice processing. This pattern is also represented in the next four components.

Component IV

A larger sample of 197 specimens was recovered from 58 m^2 excavated in Component IV. A variety of taxa is represented: bison, pronghorn, small to medium artiodactyl, jackrabbit, cottontail, muskrat, ground squirrel, vole, sage grouse, sucker, freshwater mollusk, and unidentified taxa of all size grades. Exploitation of both upland and riparian environments is evidenced in these taxa. In this occupation, pronghorn seems to have been the dominant big game species, although almost equal emphasis on small and large animals is reflected in the total numbers for all specimens representative of both size grades. For the artiodactyls, elements of the limbs and their distal extremities are dominant, and the standard extraction of their maximum nutritional value is reflected in patterns of fragmentation. Although no specific evidence of seasonality is present in the sample, the freshwater mollusk suggests an occupation at sometime during spring through fall.

Component V

The 314 specimens recovered from 92 m^2 excavated in Component V constitute the largest sample of faunal remains of all the components. The taxa are represented by mule deer, pronghorn, unspecified artiodactyls, jackrabbit, cottontail, sage grouse and unspecified bird, fresh water mollusk, and unidentified taxa of all size grades. The minor representation of deer indicates that pronghorn may have been the most important big game animal, and larger animals in general appear to have been dominant in the faunal subsistence base. In the artiodactyls, elements of the limbs and distal extremities dominate, and the typical pattern of optimal utilization of the larger animals is reflected in the overall degree of fragmentation in the sample. Smaller animals consist of rabbits and bird, the latter being represented primarily by unspecified egg shell and sage grouse bone elements. The specimens of fetal to infant pronghorn and artiodactyl indicate an occupation during late winter to spring, as do the egg shell fragments. The freshwater mollusk shell indicates a broader range of season of occupation from spring through fall.

Component VI

In Component VI, 290 specimens of faunal remains were recovered from the 134 m^2 excavated. The widest variety of taxa is represented: mule deer, pronghorn, unspecified artiodactyl, jackrabbit, cottontail, unspecified rabbit, muskrat, prairie dog, ground squirrel, sage grouse, unspecified bird, sucker, freshwater mollusk, and unidentified mammals of all size grades. Unlike most other components, greater numbers of small animal specimens reflect a greater or more equal emphasis on a variety of small game. Large game species are also well represented, with pronghorn apparently being the most important large animal. Disregarding artiodactyl tooth fragments, primarily elements of the front and hind limbs are represented in the large game specimens. Typically these portions of the body appear to have been selectively transported to the site and processed for their optimal nutritional value, as evidenced by the degree of fragmentation in the overall sample. In the smaller animals, sage grouse seems to have been among the most important species procured, with significant emphasis on sucker as well. In general, the variety of species indicates a broad faunal subsistence base which suggests exploitation of a diversity of ecozones. Season of occupation is reflected specifically in the egg shell, indicating spring procurement, and generally in the fish and freshwater mollusk remains, which could have been obtained at any time from spring through fall.

Component VII

Two hundred thirty-nine faunal specimens were recovered from 92 m^2 excavated in Component VII. Taxa are represented by bison, mule deer, pronghorn, unspecified artiodactyl, jackrabbit, cottontail, unspecified rabbit, freshwater mollusk, and unidentified mammals of all size grades. Large game animals were most important in the diet, with an emphasis on pronghorn. Again, primarily front and hind quarters and their distal extremities were brought to the site and maximally processed for nutrition. Season of occupation is indicated in one specimen of a fetal to infant pronghorn, denoting a late winter to spring hunt, and the freshwater mollusk remains suggest an overlapping but broader range in season from spring to fall.

Component VIII

A sample of 18 specimens was recovered from only 10 m^2 excavated in Component VIII. The poor sampling of this occupation limits the interpretive potential. Here the remains of prairie dog and small, medium, medium to large, and large mammals are difficult to evaluate in terms of cultural behavior. Even the cultural association of the prairie dog is questionable. Generally, larger animals appear to have been the emphasis, and processing and/or disposal of these faunal remains involved fragmentation and burning of bone elements.

Discussion

The eight cultural components defined at the Taliaferro site represent occupations that occurred over a period of approximately 4000 years, from Early Archaic through Late Prehistoric times. Comparison of the various attributes of the faunal remains from each of the components reveals more similarities than differences. In a very general sense, the seasons of occupation and the patterns of acquisition, processing, and disposal of animal food sources seem to have remained fairly consistent throughout the 4000 years of occupation at the site. The major differences between components are in the types of animals that were exploited in the subsistence base.

Although there is a predominance of larger animals in most components, the emphasized species of large game varied through time. During the Late Archaic period, as represented in Component III, the preferred big game species appears to have been bison with a corresponding lesser emphasis on the smaller artiodactyls like pronghorn. Although bison is still present in two of the Late Prehistoric occupations, the smaller artiodactyls, especially pronghorn, dominated the subsistence base. This pattern is reflected in the counts of specimens as well as in the minimum numbers of individuals. Given the small sample size and considering that only portions of the bodies of all these individual animals were brought to the site, it is difficult to assess the significance of this pattern in the broader cultural context. Generally in southwestern Wyoming, there appears to have been a shift toward emphasis on pronghorn procurement during the Late Prehistoric period (Reiss and Walker 1982; Schroedl 1985; Zier 1982) although bison was still a significant constituent in the diets as it had been during Archaic times.

A greater emphasis on a variety of small animals is also apparent in the Late Prehistoric components. In the small samples from the Archaic Components I, II, and III, specimens of small animals are represented in minor proportions as unidentified taxa. In the majority of the Late Prehistoric components, the small animals also are represented by lower frequencies, but as a variety of identified taxa. As mentioned before, Component VI is the exception; here the major proportion of faunal remains is composed of small animals. In this component and in Component IV, the widest variety of small animals is represented, most of which could have been procured in the immediate vicinity of the site. The presence of fish remains in these components suggests the exploitation of a riverine habitat some distance from the site, although it is possible that the nearby creek could have supported large fish in the past. The mussel shell in the Late Prehistoric components and one Archaic component provides more compelling evidence for the use of the riverine environment. The inclusion in the subsistence base of upland small game animals, such as rabbits, rodents, and sage grouse, appears to be a fairly common practice during Late Prehistoric times in the area (Armatage et al. 1982; Frison 1971, 1973; Harrell and McKern 1986; Hoefer 1986; McGuire 1977; Zier 1982).

Generally the evidence in the faunal remains from the Taliaferro site shows that during the 5000 years of occupation, the inhabitants relied primarily on large game animals, bringing selected portions of the bodies to the site to process for their maximum nutritional value. A change in preference from bison to pronghorn seems to have occurred from Archaic to Late Prehistoric times. At the same time, the composition of subsistence base changed from a heavier dependence on large game in the Archaic to a more varied diet, which consisted of a number of small animals, in the Late Prehistoric occupations.

APPENDIX F

SEDIMENT ANALYSIS

By J. C. Miller

Physiography

The Taliaferro site (48LN1468) is located on a low to moderate relief interfluvial ridge between Slate Creek, to the north, and one of its unnamed tributaries to the south. Slate Creek is a tributary of the Green River, which is east of the site location. The site is situated amongst the dissected pediment remnants of Pleistocene age in the western Green River Basin and is several kilometers from the mountains of the Wyomide Ranges section of the Middle Rocky Mountain Province to the west. Physiographically the site is in the westernmost basin of the Wyoming Basin Province of the Rocky Mountain System Division (Fenneman 1946; Figures 1 and 2).

The cultural material of the site is contained in eolian shadow deposits in association with a number of small dunes. The dunes are migrating along the ridge itself, along Slate Creek's southern tributary, and east of a small playa lake in the southeast margin of the site's indicated boundaries. Dunes on the site are small domes and transverse or barchanoid ridges. General migration is to the east and northeast. Dome forms are or were moving to the southeast.

Physiographic features in the area include the dissected pediment remnants, ancient terraces, eolian landforms (deposits and playas), limited late Pleistocene and Holocene fill in the drainage bottoms, and periglacial features (frost wedges and polygons). The pediment remnants, represented by diamictite facies (thin pebble-cobble veneers) deposits overlying truncated Green River and Bridger formation sediments, are of Pleistocene age. Numerous such remnants at varying elevations are relics of various periods of down-cutting in the local area and, so, are of differing ages. The remnants form benches between dissections and are usually low to moderate relief features. Some can be considered remnants of older cut terraces associated with the Green River.

Eolian landforms and features are perhaps the most noticeable in the vicinity of the site. Eolian shadows are most common with lesser mobile constituents evident. Shadows accumulate in late Pleistocene drainage and drainage head dissections or where entrapment is enhanced by vegetation cover. Mobile deposits consist of small dome types on the ridge tops and larger barchanoid and transverse ridges in some alluvial valleys. The mobile deposits are locally best developed on the lee of the small playa lake in the eastern edge of the site. The playa lake is an eolian feature as well, albeit a deflational one. The playa has contributed a significant quantity of material to a small dune field on its eastern flank. Dependent upon past climates, the playa may have preserved varves representing annual flooding. The necessary condition to preserve varves would include cooler, wetter climates to preserve standing water in the playa and prevent deflation. Warmer, dryer climates evaporate the playa water and increase the salinity and alkalynity of the lake bed, which prevents stabilization by vegetation. Deflation occurs rapidly in these instances as is indicated by the lee dunefield of the playa. Seasonal runoff and other precipitation events still contribute material to the playa bed, but its tenure there is short lived.

Slate Creek and other small alluvial valleys in the vicinity contain limited late Pleistocene and Holocene deposition in the form of built terraces (Figure 3). On Slate Creek, a thin veneer (ca. 15-25 cm) of late Pleistocene alluvial overbank deposits blankets almost the entire width of the valley. These deposits consist of thin-bedded clays deposited under variable climatic conditions. Olive clays are interbedded with red clays. Olive clays represent cool/moist climates and infer dense vegetation cover which produces

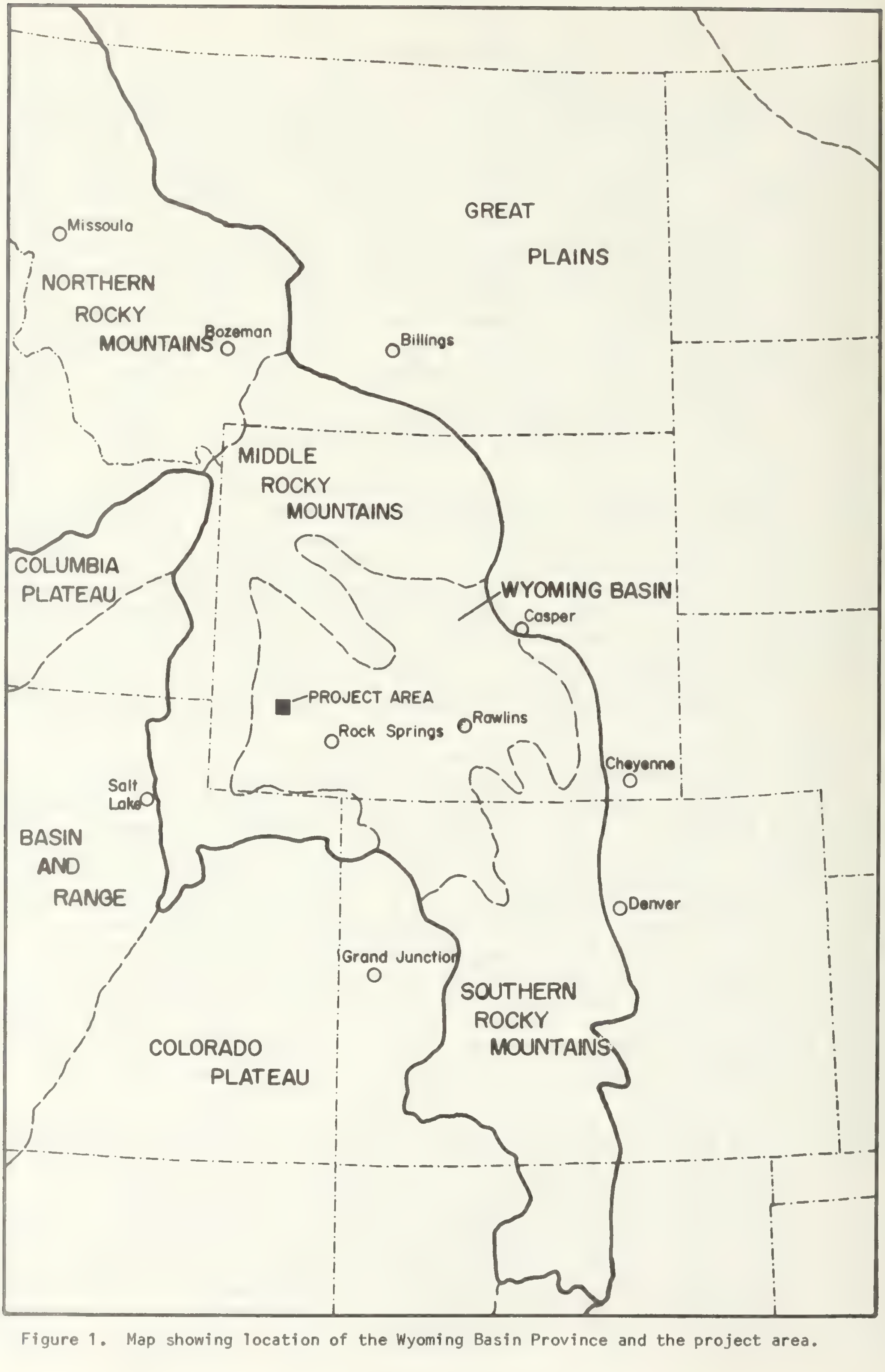


Figure 1. Map showing location of the Wyoming Basin Province and the project area.

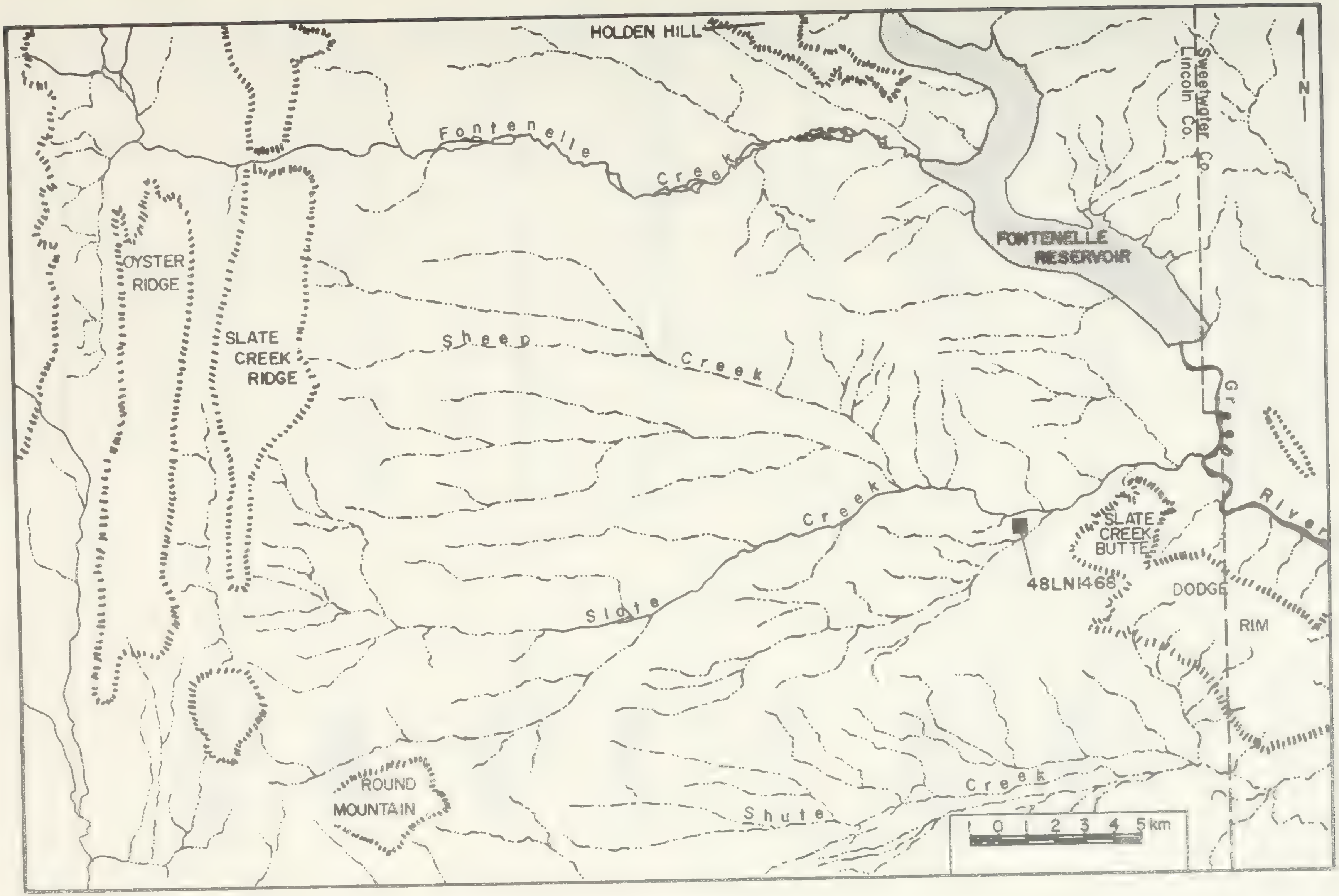
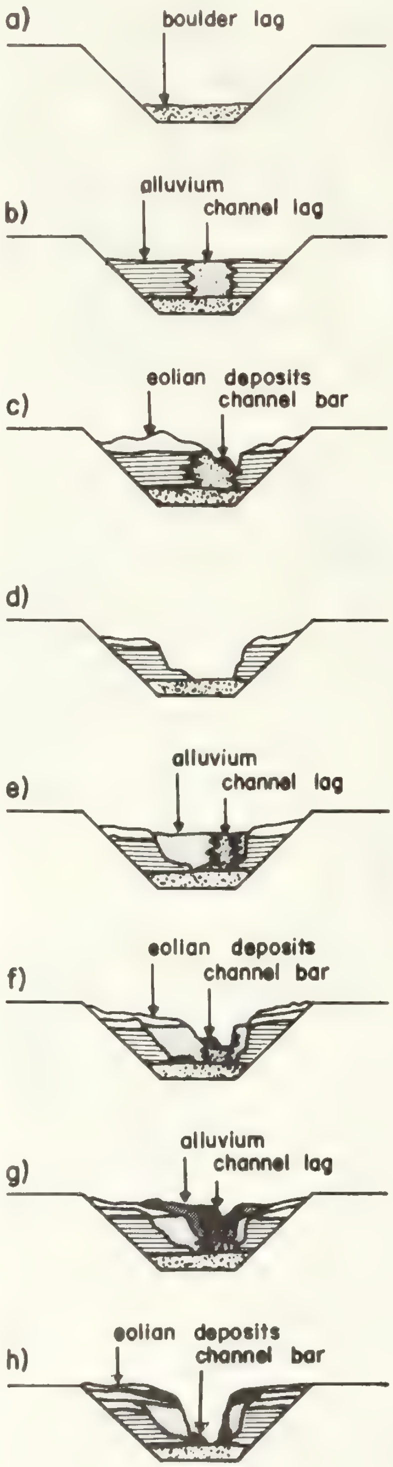


Figure 2. Map showing local physiographic features in relation to the site.



1. Limit of latest Pleistocene dissection and abandonment of basal lag, ca. 13,600 years BP
2. Limit of Anathermal aggradation, regression to ephemeral flow, and deflation, ca. 8,700 years BP
3. End of Altithermal eolian activity, surface stabilization, and rejuvenation, ca. 5,700 years BP
4. Limit of Neoglacial dissection, ca. 3,900 years BP
5. Limit of latest Neoglacial aggradation, regression to ephemeral flow, and deflation, ca. 3,400 years BP
6. Limit of Medithermal dissection ca. 1,300 years BP
7. Limit of latest Medithermal aggradation, regression to ephemeral flow, and deflation, ca. 900 years BP
8. Limit to Recent dissection, modern day

Figure 3. Idealized stratigraphic sequence for Slate Creek and similar drainages.

acids that prevent the sediments from oxidizing. The alternate red beds represent temporary reversals of the climate to warmer/dryer conditions. These reversals allowed oxidation near and at the surface, which destroyed organic acids. Coevally deposited with these overbank clays are cobble and pebble lag deposits relic of a small perennial stream that was the ancestral Slate Creek. Inset in these late Pleistocene deposits and overlying the lag deposits are another series of deposits which span the accepted boundary of the Pleistocene and Holocene epochs. Deposited under dry climatic conditions, these deposits are likely the result of devegetation or decreased vegetative cover which made a greater quantity of sediment available for transport. As such, the deposits spanning the Pleistocene and Holocene boundary are braided stream deposits. This set of terrace deposits can be identified by their crossbedded, sandy character. These are capped by a paleosol which features eluvial development to a depth of about 1.5 to 2.0m (Miller 1986a). This paleosol is evident immediately north of 48LN1468, although it is severely weathered. The formation of the paleosol precedes the Altithermal droughts. Mobile eolian deposits of Altithermal age overlie these braided stream deposits and the paleosol. In some instances, notably where the upper part of the paleosol is exposed, the paleosol development has continued at differing rates since inception. Development rates are increased in wet periods and decreased in dry. In some drainages, one or two other built terraces are inset in the late Pleistocene and Holocene (or Anathermal) terrace. Construction of the highest of these two inset terraces occurred in Medithermal times. The lowest is rather recent and consists of gravel and sand bars rather than overbank alluvium. During recent dissection, some or all of these two lower terraces have been removed as Slate Creek rejuvenated. In some reaches of the stream, the late Pleistocene lag cobble has been exposed by downcutting.

Periglacial features were encountered in the open trench inspection for the LaBarge Project trunkline, which runs between the Dehydration site and the Shute Creek Plant (Miller and Bower 1986). These features were frost wedges and the associated frost polygons. Two distinct sets of these features were observed. The older set featured penetration into the substrate of about 1.5 to 2.0 m. A second, more recent, set penetrated less than a meter. Wedges of the older set were found ca. 2.0 km southeast of the Taliaferro site, just south of the point of intersection of the trunkline and Wyoming State Highway 372. Much of what is known of these features was detailed by Mears (1981).

Stratigraphy

The Taliaferro site is contained in mobile (dome) and immobile (shadow) eolian deposits lying in a late Pleistocene drainage feature which is apparent on the topographic map of the site (Figure 4). Depth of deposition is greater than ca. 1.0 m over much of the site, and several cultural components were identified. The oldest component was aged at ca. 5290 B.P., and the successive components are aged to as recent as 900 B.P. The deposits of eolian origin are probably much older than this date indicates. Site 48LN1658, located a few kilometers northwest of the Taliaferro site, contained deposits aging 9530 ± 300 B.P. (Beta-13871; Miller and Bower 1986) and is in an identical physiographic location. It is expected that the lower deposits at the Taliaferro site are at least of similar antiquity.

The mixed eolian deposits at the Taliaferro site are predominantly shadow aggradations with some smaller dome dunes evident. The dome dunes represent small mobile deposits that migrated into the late Pleistocene drainage

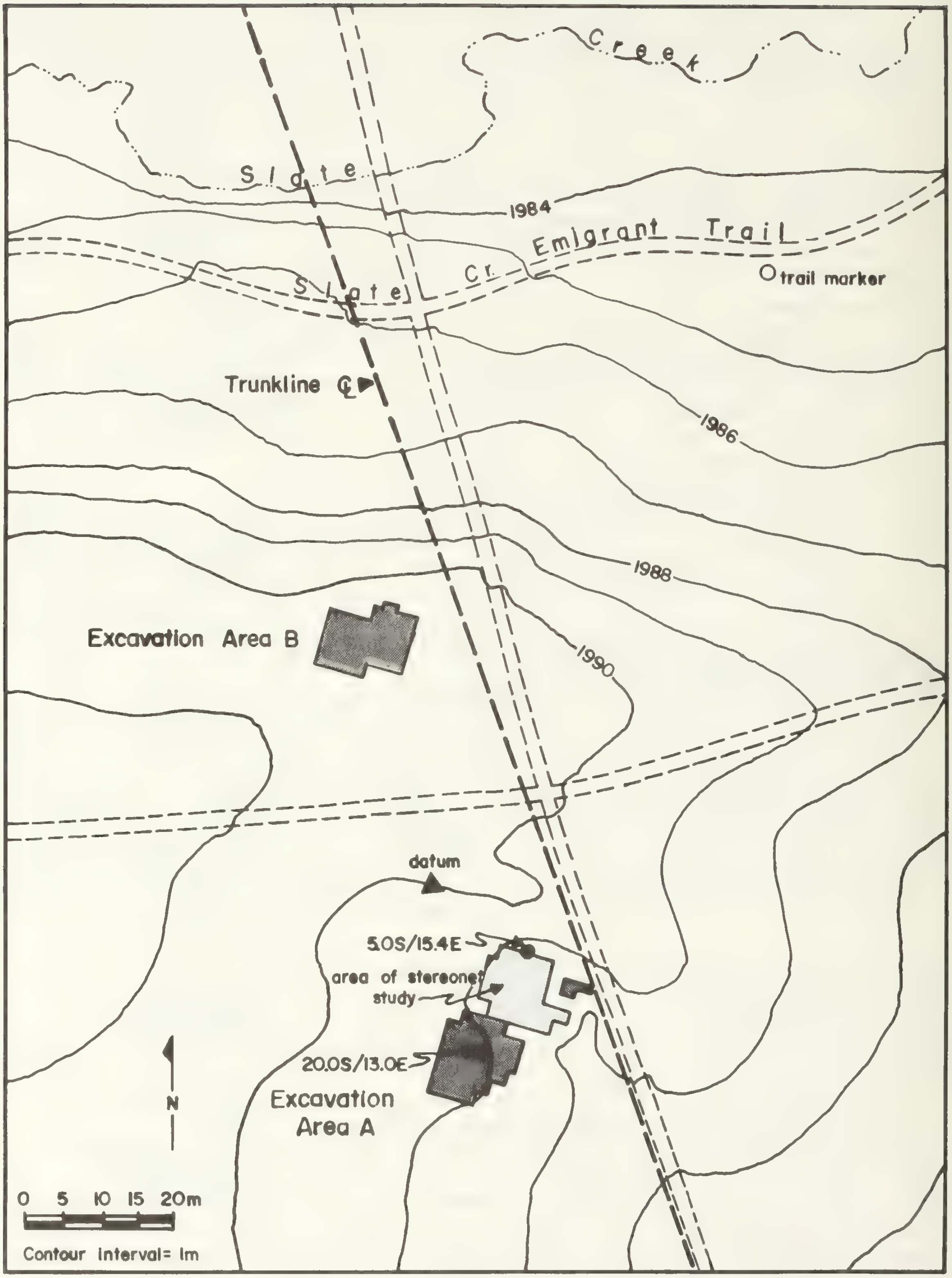


Figure 4. Topographic map of site area. The late Pleistocene drainage dissection is apparent under the north half and the north half of the south half of Excavation Area A.

feature and were stranded there when wind energy was insufficient for them to continue their migration. The shadows are laminar sheet-like deposits in the hollows and drape over older topographic features. Certain horizons in the shadows represent deflated surfaces and other horizons are eluvial and illuvial developments.

Sampling Methodology

After the cultural components were fully exposed by excavation, areas were selected that provided the best examples of site deposition with all noted stratigraphic units represented. Two columns were drawn: one at 20.00S/ 13.00E and the other at 5.00S/15.40E, both in Excavation Area A (see Figure 4). Maximum sample size was 5 cm in vertical height with a variable width; approximately 50 g of material was collected for each sample. The sample column was complete; that is, successive samples were drawn with superadjacent and subjacent samples sharing common boundaries. As stratigraphic profiles were completed before sampling, it was possible to sample visually distinguishable strata individually, and no samples were drawn that crossed visible stratigraphic boundaries. Vertical height of some samples was less than 5 cm in these instances.

Laboratory Methodology

In the Geoarchaeology Laboratory at Western Wyoming College, the columns drawn at 20.00S/13.00E and 5.00S/15.40E in Area A of the excavation block were subjected to detailed analysis, which discriminated various parameters of the sediments for reconstruction of depositional histories and past climates. Geoarchaeology Laboratory (GL) sample numbers were assigned during sample log-in to track samples during the analysis process.

In the laboratory, the samples were split using a Jones type splitter. Split portions were used to examine aspects of grain size, grain morphology, geochemistry, and genesis. Grain size was determined by sieving and settling tube. Sieves were used with openings equivalent to Krumbein's (1934) Ø (phi) scale, the negative log (base two) of Wentworth's (1922) grain size scale. Table 1 relates metric and phi sizes. As recommended by Folk (1974:31), ¼ Ø increments were used. All weights were taken to .0001 g accuracy. For each sample, a histogram of Ø size versus weight percent and a log probability plot of Ø size versus cumulative percent coarser were completed. Histograms were used to determine genesis of grain populations and mode. The utility of the latter graph was in the determination of the statistical parameters of the grain size population (i.e., mean, median, mode, standard deviation or sorting, skewness, and kurtosis). Table 2 gives the formulae used to derive the statistical parameters by graphical means. Median is not listed. This is simply the Ø size at 50% on the latter graph. Grain sizes of less than 4.00Ø (.0625 mm) down to 10Ø (.00098 mm) were determined, if necessary, using a settling tube and the pipette method. Phi sizes of 11 and smaller are affected by Brownian motion and were not considered in the analysis. The pipette or settling tube analysis is based on Stokes Law. The relationship is exhibited in the formula

$$T = \frac{D}{1500Ad^2}$$

where T is the time (minutes), D is depth of withdrawal (cm), A is a value of water viscosity corrected for temperature, d is the particle diameter (mm), and 1500 is a constant. Previous to pipette analyses, the samples were

Table 1. Comparison of U.S. Standard Mesh, mm, Phi (Ø) size and Wentworth size classes (Pettijohn et al. 1972).

	US Standard sieve mesh	Millimeters		Phi (Ø) Units	Wentworth size class
Gravel		4096		-12	boulder
		1024		-10	
		256	256	-8	
		64	64	-6	cobble
		16		-4	pebble
	5	4	4	-2	
	6	3.36		-1.75	
	7	2.83		-1.5	granule
	8	2.38		-1.25	
	10	2.00	2	-1.0	
Sand	12	1.68	1	-0.75	
	14	1.41		-0.5	very coarse sand
	16	1.19		-0.25	
	18	1.00	1	0.0	
	20	0.84		0.25	
	25	0.71		0.5	coarse sand
	30	0.59		0.75	
	35	0.50	1/2	1.0	
	40	0.42		1.25	
	45	0.35		1.5	medium sand
	50	0.30		1.75	
	60	0.25	1/4	2.0	
	70	0.210		2.25	
	80	0.177		2.5	fine sand
	100	0.149		2.75	
	120	0.125	1/8	3.0	
	140	0.105		3.25	
	170	0.088		3.5	very fine sand
	200	0.074		3.75	
	230	0.0625	1/16	4.0	
Silt	270	0.053		4.25	
	325	0.044		4.5	coarse silt
		0.037		4.75	
		0.031	1/32	5.0	
		0.0156	1/64	6.0	medium silt
		0.0078	1/128	7.0	fine silt
		0.0039	1/256	8.0	very fine silt
Clay		0.0020		9.0	
		0.00098		10.0	clay
		0.00049		11.0	
		0.00024		12.0	
		0.00012		13.0	
		0.00006		14.0	

Table 2. Graphical determination formulae for selected statistical parameters (Folk 1974).

graphic mean grain size (M_z)	$= \frac{\phi 16 + \phi 50 + \phi 84}{3}$
inclusive graphic standard deviation (σ_I)	$= \frac{\phi 84 - \phi 16}{4} + \frac{\phi 95 - \phi 5}{6.6}$
inclusive graphic skewness (sk_I)	$= \frac{\phi 16 + \phi 84 - 2\phi 50}{2(\phi 84 - \phi 16)} + \frac{\phi 5 + \phi 95 - 2\phi 50}{2(\phi 95 - \phi 5)}$
graphic kurtosis (k_g)	$= \frac{\phi 95 - \phi 5}{2.44\ (\phi 75 - \phi 25)}$

Note: variables listed as "Ø16" (for example) means "Phi size at 16%, cumulative percent coarser", derived from log probability/phi size plots.

disaggregated chemically by adding an alloquat of sodium-hexametaphosphate $[(NaPO_3)_6]$. Cumulative percent coarser was then calculated using the formula

$$\text{Cumulative \% coarser} = \frac{100\ (S + F - P)}{S + F}$$

where S is the weight of the sieved sample, F is the weight of the 4.Ø pipette withdrawal, and P is the weight of the additional withdrawals for the 4.5, 5, 5.5, 6, 7, 8, 9, and 10 phi sizes.

Each fraction of sediment was studied under a binocular microscope to determine the percentage of aggregates. All samples were subjected to physical disaggregation using wood and rubber implements twice before sieving. However, if the sample was determined to have more than 25% aggregates during weighing, the sample was subjected to disaggregation again with a subsequent resieving.

Other split fractions were used in geochemical studies. Portions of all samples were subject to analysis to determine total CO_3, total organic carbon, pH, conductivity, mineralology, angularity, sphericity, and color. Total CO_3 was determined using the pressure calcimeter method (Allison and Moodie 1965:1392-1396). Total organic carbon was determined using the Walkley-Black method (Allison 1965:1372-1376).

Measurements of pH and conductivity were determined using test meters. For preparation, the samples were immersed in 450 ml of deionized water and agitated for 30 seconds, turbidity was allowed to settle before the readings were made.

Mineralogy was determined using a petrographic microscope. Samples for study were drawn from the 3.75Ø (.074 mm) sieve after weighing. Slides were prepared with refractive oils. Initially, 100 grains were counted and percentages of minerals tallied. Subsequently, the entirety of the prepared sample was scanned for trace minerals.

Color, angularity (or roundness), and sphericity were determined for each sample as well. Munsell Soil Color Charts were used for color. Angularity/sphericity were determined using Power's (1982) comparison chart incorporating Folk's (1955) median rho values for use in statistical studies.

Stereonet Methodology

After cultural Component I was completely exposed, attitude and dip data was obtained from numerous pieces of thermally altered rock in order to determine the relative modification of site material location and details of those modifying events. The Wulff equal angle stereonet was applied as the relationships documented were represented by angular data. Thermally-altered rock that fit certain criteria was selected from the available field. Those criteria were geometric shape and position in relation to hearth features. Specimens with a tabular shape (i.e., platelike with thickness being the smallest dimension) not contained in feature fill were selected for measurement. Attitude was determined by extending the plane of the surface upon which the specimen rested with a non-metallic mapboard and measuring the "strike" or attitude of the specimen in the same manner as strikes are determined for geologic units. Attitude is defined as the compass bearing, relative to north, of two points of equal elevation on the same plane. Dip was determined by clinometer measurements on the same plane perpendicular to the attitude line as defined above. Dip measurements are in relation to a horizontal line and include aspect or facing as part of the reading. One hundred twenty three readings were taken, all in the northern half of Excavation Area A. The stereonet resolution will be discussed later.

Stratigraphic Interpretations

Commonly, two major depositional units are reported from this region of the Green River Basin (see Ahlbrandt and Downing 1984) and this relationship is portrayed by the Taliaferro site deposits. The lower sand is usually a well indurated deposit, i.e., subject to a greater period of eluvial weathering when compared to the upper units, which usually postdate the Neoglacial period of Miller (1986a). This relationship is documented in column 20.00S/13.00E by the increase in silts and clays and decreasing mean sizes. The horizon is also noted in column 5.00S/15.40E by decreasing mean sizes, but the increase in clays and silts is not noticeable because of other overriding factors. Tables 3 and 4 give the results of analysis for columns 20.00S/13.00E and 5.00S/15.40E respectively. Graphical displays are presented in Figures 5 through 8. Idealized sequences and stratigraphy associated with the columns can be found in Figure 9. It is noted that Smith (main body of this report) "lumped" stratigraphic units to create four strata on column 5.00S/15.40E from seven recorded in the field. Similarly, five strata are shown for 20.00S/13.00E, whereas nine were reported in the field. In the following discussion, the field designations will be used. Figure 10 provides a rough correlation of strata designations used in the main body of this report and those used here.

Column 20.00S/13.00E represents a total depth of ca. 1.50 m that sampled a portion of the eolian shadow in the southern edge of the late Pleistocene drainage head dissection in which the Area A deposits have accumulated. A minor topographical rise to the south of the depression forms the obstruction behind which this thicker sequence was deposited. Column 5.00S/15.40W is shallower, ca. 1.00 m, and situated in the northern edge of the same drainage feature. The northern portion of the feature was continuously stripped, or deflated, whereas the southern portion was better protected on the lee of a feature. This also explains the discordance of the relative eluvial developments in the two columns. The shallower depth of the northern column and exposure to wind likely decreased effective soil moisture in the deposits. As subsurface stored moisture is the primary agent of eluviation, this explains the discordance.

Table 3. Analytical results of samples drawn from 5.00S/15.40E on the Taliaferro site (48LN1468).

GL No.	ASS NO.	cm BS	Munsell Wet	Munsell Dry	Ang.	Spher.	Total CO_3 (%)	Cond. (µmhos/cm)	pH	Ø Mean	Ø Median	Ø Mode	Ø Sorting	Skewness	Kurtosis	Total organic C %	clay/ % silts
132	541	0-5	10YR3/2	10YR5/2	3.5	2.5	1.91	16.1	9.0	2.33	2.20	2.00	.86	.26	1.02	.248	6.2
133	542	5-10	10YR3/2	10YR5/2	3.5	2.5	2.02	20.8	9.35	2.45	2.40	2.00	.83	.16	1.21	.241	6.3
134	543	10-15	2.5YR4/2	2.5YR5/2	3.0	2.5	2.83	25.5	9.55	2.60	2.40	2.25	.94	.35	1.09	.289	9.7
135	544	15-17	10YR3/3	10YR5/3	3.0	2.5	4.35	29.3	9.60	2.52	2.40	2.00	.88	.25	1.15	.365	8.2
136	545	17-22	10YR3/2	10YR5/2	3.0	2.5	5.84	33.5	9.60	2.52	2.40	2.00	.88	.25	1.27	.376	8.3
137	546	22-27	2.5YR3/2	2.5YR5/2	3.0	2.5	5.23	33.7	9.70	2.57	2.45	2.25	.89	.25	1.23	.273	9.2
138	547	27-32	2.5YR4/2	2.5YR5/2	3.0	2.5	5.00	34.0	9.70	2.45	2.45	2.00	.91	.26	1.10	.279	10.2
139	548	32-37	2.5YR4/2	2.5YR5/2	3.0	2.5	4.35	35.7	9.75	2.50	2.40	2.00	.93	.25	1.25	.245	8.7
140	549	37-40	2.5YR4/3	2.5YR5/3	3.0	2.5	4.35	35.8	9.70	2.52	2.40	2.00	.93	.24	1.15	.220	8.6
141	550	40-45	2.5Y4/3	2.5Y5/3	3.0	2.5	4.01	34.5	9.70	2.48	2.40	2.00	.94	.20	1.08	.235	8.6
142	551	45-49	2.5Y3/2	2.5Y5/2	3.0	2.5	3.28	31.4	9.70	2.50	2.40	2.00	.98	.24	1.06	.274	9.2
143	552	49-54	2.5Y4/2	2.5Y5/2	3.0	2.5	3.55	37.1	9.80	2.53	2.40	2.00	1.00	.24	1.13	.264	10.2
144	553	54-59	2.5Y3/2	2.5Y5/2	3.0	2.5	2.90	39.4	9.80	2.50	2.30	2.00	1.02	.32	1.18	.214	11.3
145	554	59-62	2.5Y3/2	2.5Y5/2	3.0	2.5	5.00	39.6	9.80	1.55	2.10	2.00	2.05	-.31	1.75	.254	9.6
146	555	62-67	2.5Y4/2	2.5Y5/2	3.0	3.5	3.82	36.2	9.80	1.70	1.90	2.00	1.67	-.17	1.72	.168	7.7
147	556	67-72	2.5Y4/2	2.5Y5/2	3.0	3.5	3.67	40.8	9.80	2.25	2.20	2.00	1.42	-.06	1.45	.153	8.7
148	557	72-77	2.5Y4/2	2.5Y5/2	3.0	3.5	5.04	38.3	9.80	2.12	2.05	2.00	1.41	-.51	1.92	.154	7.1
149	558	77-82	2.5Y4/2	2.5Y5/2	3.0	2.5	4.58	40.9	9.85	2.32	2.20	2.00	1.37	.05	1.55	.143	10.3
150	559	82-87	2.5Y4/2	2.5Y5/2	3.0	2.5	4.77	39.6	9.95	2.17	2.10	2.00	1.49	-.08	2.15	-.132	7.5
151	560	87-92	2.5Y4/2	2.5Y5/2	3.0	2.5	3.74	39.1	9.85	2.23	2.20	2.00	1.44	-.13	2.19	.107	7.6
152	561	92-97	2.5Y4/2	2.5Y5/2	3.0	3.5	3.05	35.3	9.9	2.33	2.20	2.00	.89	.28	1.31	.092	6.6

CM = Centimeter
BS = Below Surface
Ang = Angularity
Spher = Sphericity
Cond. = Conductivity

Table 4. Analytical results of samples drawn from 20.00S/13.00E on the Taliaferro site (48LN1468).

GL No.	ASS NO.	cm BS	Munsell Wet	Munsell Dry	Ang.	Spher.	Total CO_3 (%)	Cond. (μmhos/cm)	pH	Ø Mean	Ø Median	Ø Mode	Ø Sorting	Skewness	Kurtosis	Total organic C %	clay/ % silts
153	691	0-5	10YR3/3	2.5Y5/4	2.5	2.5	2.63	27.3	9.60	2.50	2.40	2.25	.80	.24	1.15	.255	6.3
154	692	5-10	10YR3/3	2.5Y5/4	2.5	2.5	2.48	24.3	9.60	2.47	2.40	2.25	.74	.19	1.12	.253	4.7
155	693	10-15	10YR3/3	2.5Y5/4	2.5	2.5	3.17	27.0	9.50	2.42	2.30	2.00	.80	.24	1.11	.313	5.2
156	694	15-21	10YR3/3	2.5Y5/4	2.5	2.5	2.21	25.6	9.50	2.49	2.40	2.00	.83	.20	1.01	.302	5.6
157	695	21-25	10YR3/4	10YR5/4	3.0	3.5	2.98	23.8	9.60	2.61	2.45	2.25	.83	.30	1.06	.245	8.0
158	696	25-28	10YR3/3	10YR5/3	3.0	3.5	2.90	22.0	9.50	2.53	2.40	2.25	.81	.30	1.00	.255	6.9
159	697	28-33	10YR3/3	10YR5/3	3.0	3.5	2.25	22.8	9.50	2.39	2.28	2.00	.80	.27	1.09	.200	6.0
160	698	33-38	10YR3/4	2.5Y5/4	3.0	3.5	2.33	20.0	9.50	2.35	2.20	2.00	.80	.34	1.23	.170	5.0
161	699	38-43	10YR3/4	2.5Y5/4	3.0	3.5	2.29	21.8	9.50	2.35	2.20	2.00	.80	.31	1.11	.144	5.6
162	700	43-48	10YR3/4	2.5Y5/4	3.0	3.5	2.18	18.6	9.30	2.31	2.23	2.00	.76	.22	1.19	.129	4.6
163	701	48-50	10YR3/3	10YR5/3	3.0	3.5	1.99	19.4	9.50	2.31	2.20	2.00	.75	.26	1.15	.159	4.3
164	702	50-55	10YR3/2	10YR5/2	3.0	3.5	1.91	27.7	9.55	2.32	2.10	1.75	.95	.37	1.04	.343	8.0
165	703	55-60	10YR3/2	10YR5/2	3.0	2.5	1.18	25.1	9.50	2.33	2.20	2.00	.87	.34	1.27	.343	7.3
166	704	60-65	10YR3/2	10YR4/2	3.0	2.5	1.26	24.9	9.60	2.33	2.20	2.00	.86	.30	1.32	.345	6.8
167	705	65-70	10YR3/2	10YR4/2	3.0	2.5	1.03	23.3	9.55	2.40	2.25	2.00	.83	.32	1.19	.406	6.9
168	706	70-72	10YR2/2	10YR4/2	3.0	2.5	1.26	28.2	9.60	2.30	2.20	2.00	.81	.29	1.25	.6	6.4
169	707	72-77	10YR2/2	10YR3/2	3.0	2.5	1.79	26.3	9.50	2.37	2.25	2.00	.90	.28	1.19	.526	7.8
170	708	77-81	10YR3/2	10YR4/2	3.0	3.5	1.22	22.9	9.50	2.38	2.25	2.25	.91	.29	1.19	.427	7.7
171	709	81-86	10YR3/2	10YR5/2	3.0	3.5	.76	19.8	9.55	2.35	2.20	2.00	.89	.34	1.29	.254	7.8
172	710	86-91	10YR3/2	2.5Y4/4	3.0	2.5	.92	20.5	9.50	2.57	2.40	2.00	.96	.44	1.09	.266	9.7
173	711	91-94	10YR3/3	2.5Y4/4	3.0	3.5	2.60	28.6	9.65	2.38	2.25	2.00	.91	.29	1.19	.368	7.6
174	712	94-99	10YR3/3	2.5Y5/4	3.0	3.5	3.74	32.1	9.65	2.57	2.40	2.00	.99	.28	1.16	.335	10.2
175	713	99-104	10YR3/3	2.5Y5/4	3.0	3.5	4.01	35.1	9.70	2.67	2.50	2.00	1.02	.23	.86	.298	12.4
176	714	104-109	10YR3/3	10YR5/3	3.0	3.5	3.89	35.5	9.70	2.80	2.60	2.25	1.16	.30	1.12	.331	15.4
177	715	109-114	10YR3/3	10YR5/3	2.5	3.5	4.85	33.5	9.70	2.64	2.45	2.00	.99	.21	.98	.259	9.3
178	716	114-119	10YR3/4	2.5Y5/4	3.0	3.5	4.43	38.0	9.75	2.63	2.40	2.00	1.12	.29	.95	.271	15.1
179	717	119-124	10YR4/3	10YR6/3	3.0	3.5	4.47	38.7	9.70	2.79	2.68	2.25	1.07	.15	1.20	.249	14.5
180	718	124-129	10YR4/3	10YR6/3	3.0	3.5	5.12	39.0	9.70	2.93	2.70	2.25	1.21	.27	.88	.316	21.0
181	719	129-134	10YR4/3	10YR6/3	3.0	3.5	5.54	40.8	9.70	2.87	2.65	2.00	1.24	.25	.93	.320	18.7
182	720	134-139	10YR4/3	10YR6/3	3.0	3.5	8.29	44.7	9.75	3.00	2.80	2.50	1.18	.14	.93	.295	22.3
183	721	139-144	10YR4/3	10YR5/3	3.0	3.5	6.11	47.4	9.70	2.50	2.63	2.50	1.30	.07	.82	.285	20.7
184	722	144-149	10YR4/3	10YR6/3	3.0	3.5	10.00	48.9	9.70	2.96	2.70	2.50	1.12	.28	.78	.293	22.8
185	723	149-154	10YR3/3	10YR5/3	3.0	3.5	7.22	43.6	9.75	2.92	2.73	2.75	1.42	.08	1.21	.287	20.8

CM = Centimeter
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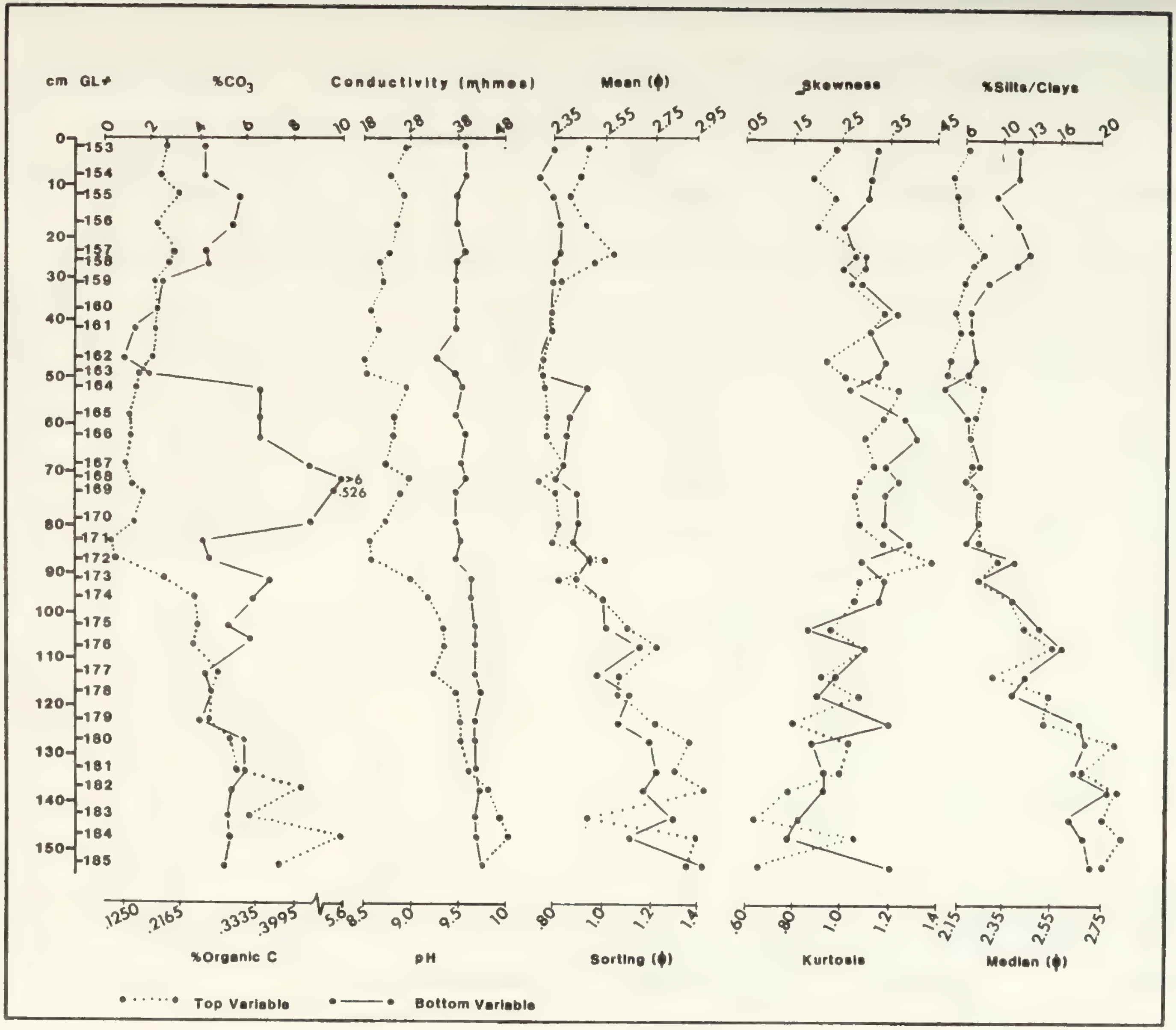

Figure 5. Graphical display of data from column 20.00S/13.00E, Excavation Area A, the Taliaferro site (48LN1468).

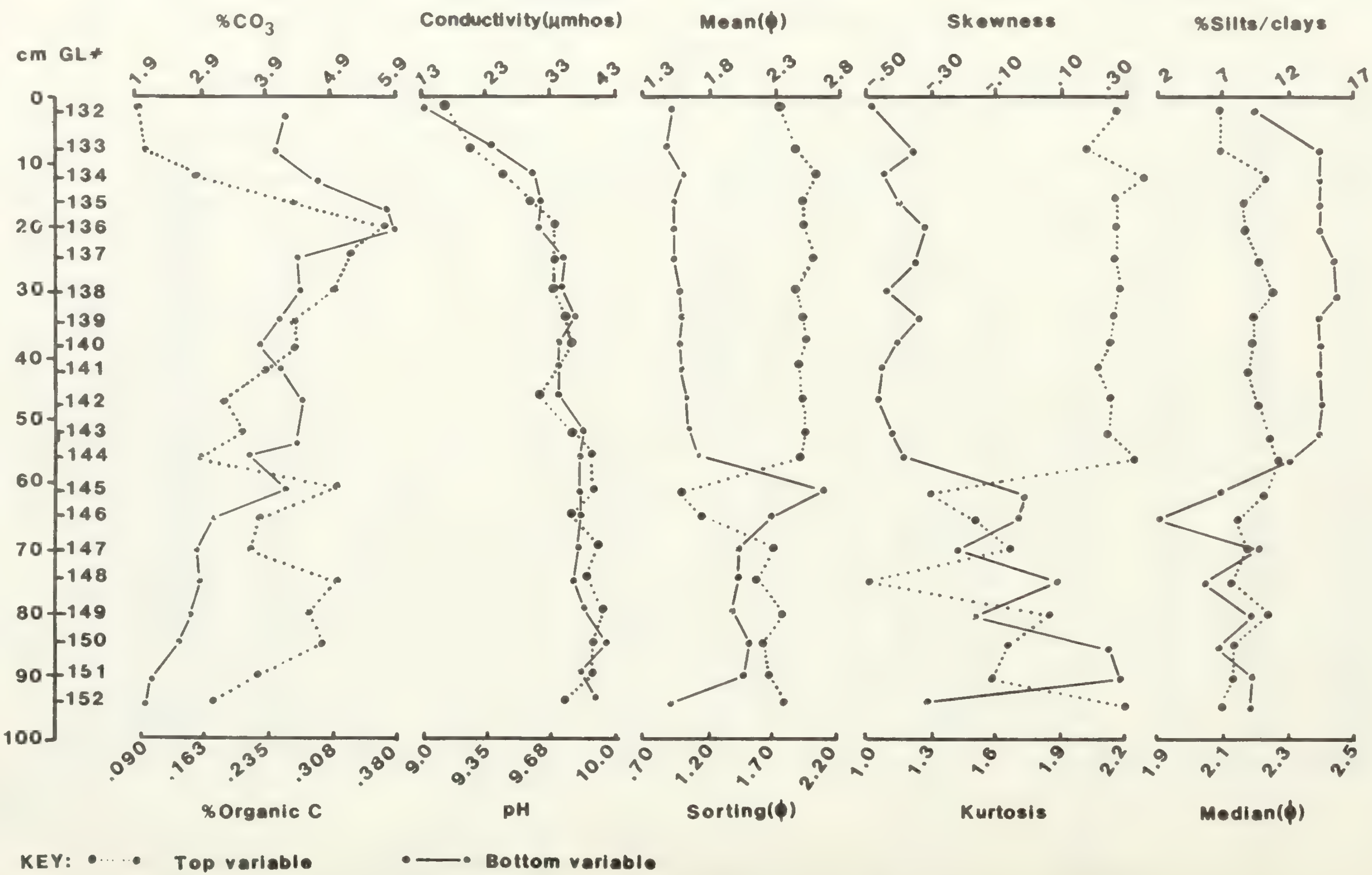

Figure 6. Graphical display of data from column 5.00S/15.40E, Excavation Area A, the Taliaferro site (48LN1468).

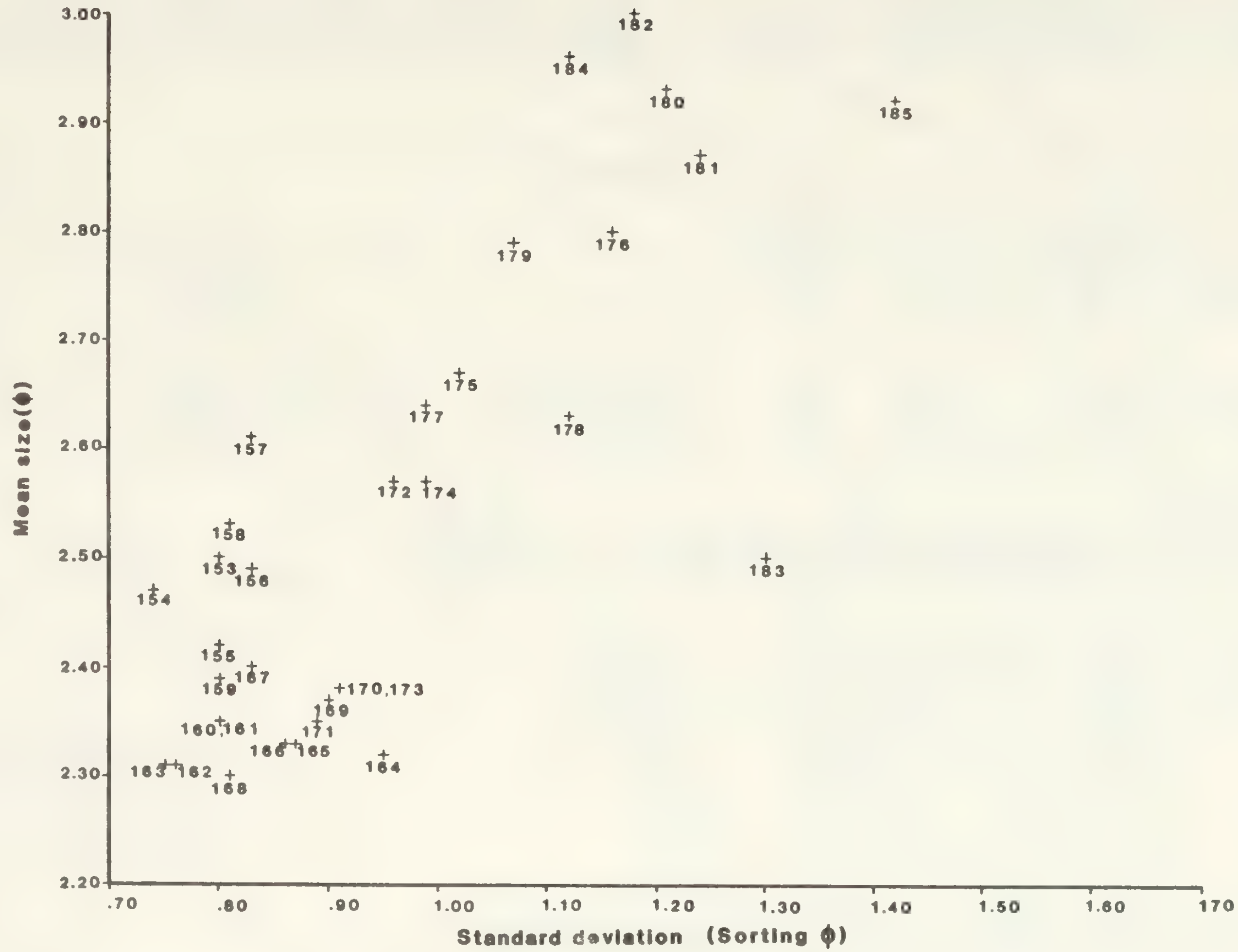

Figure 7. Mean size vs. sorting, Column 20.00S/13.00E, Excavation Area A, the Taliaferro site (48LN146B).

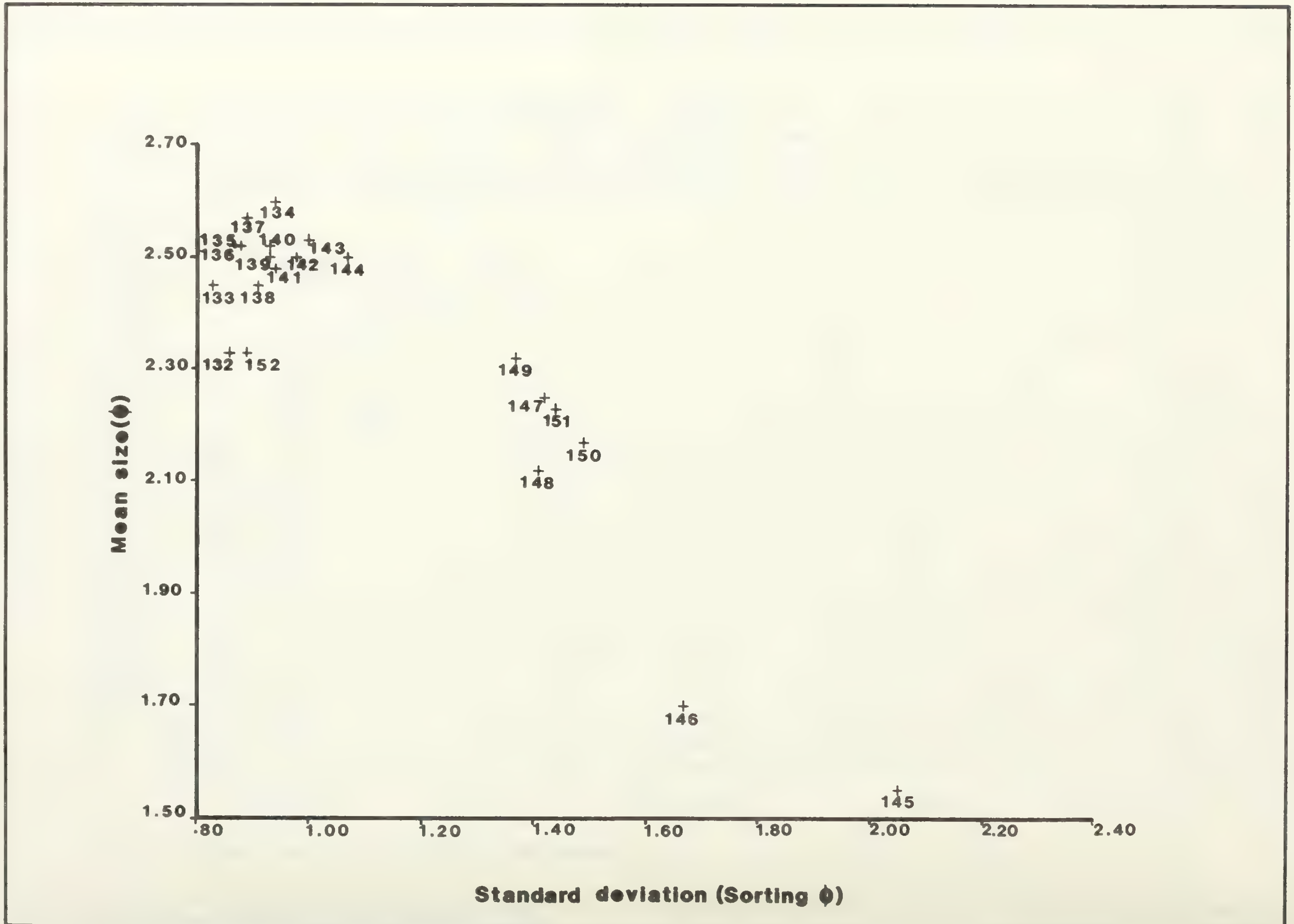

Figure 8. Mean size vs. sorting, Column 5.00S/15.40E, Excavation Area A, the Taliaferro site (48LN1468).

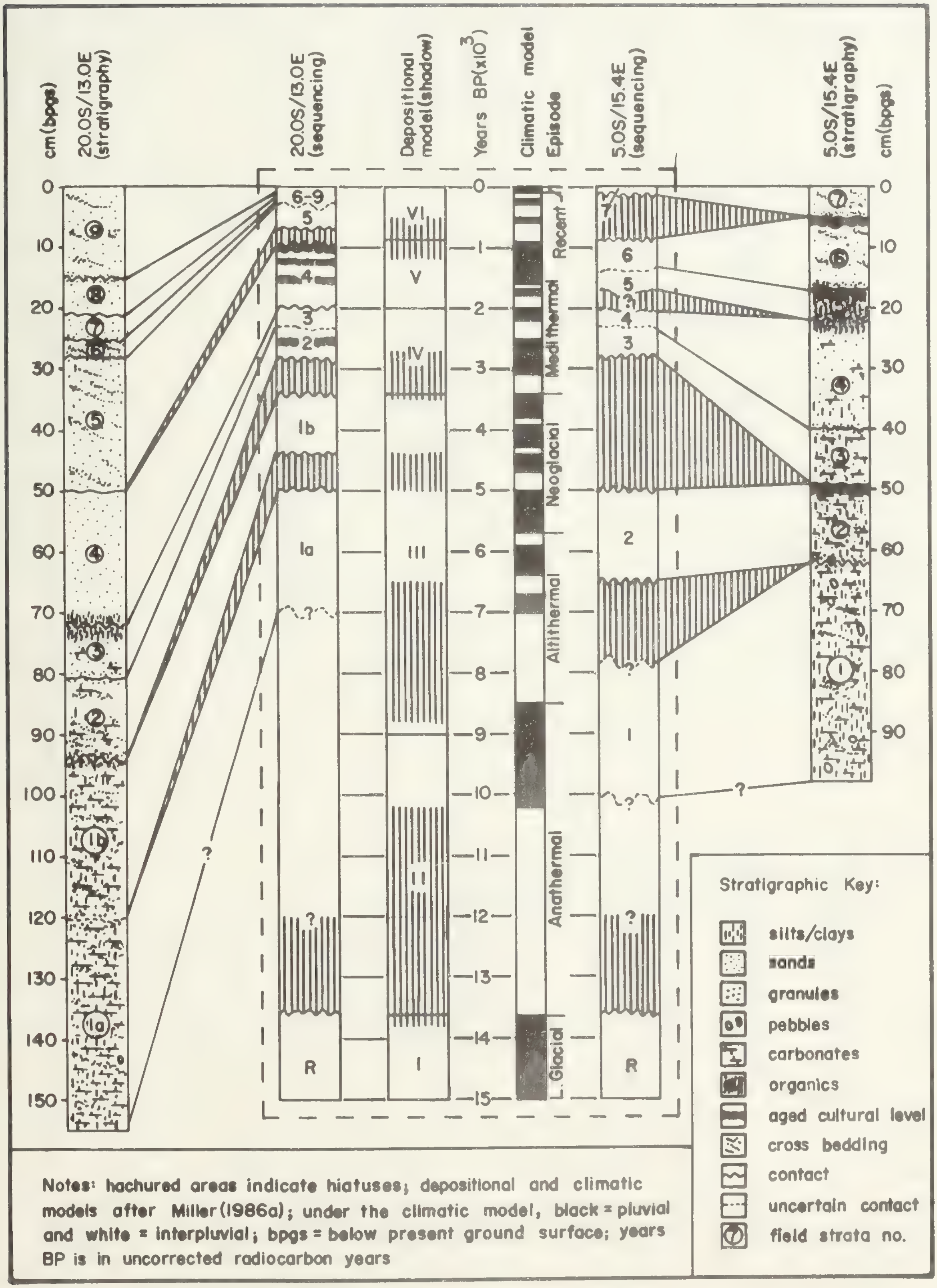

Figure 9. Idealized stratigraphy and depositional sequences for deposits of the two sediment columns with comparison to Miller's (1986a) climatic model.

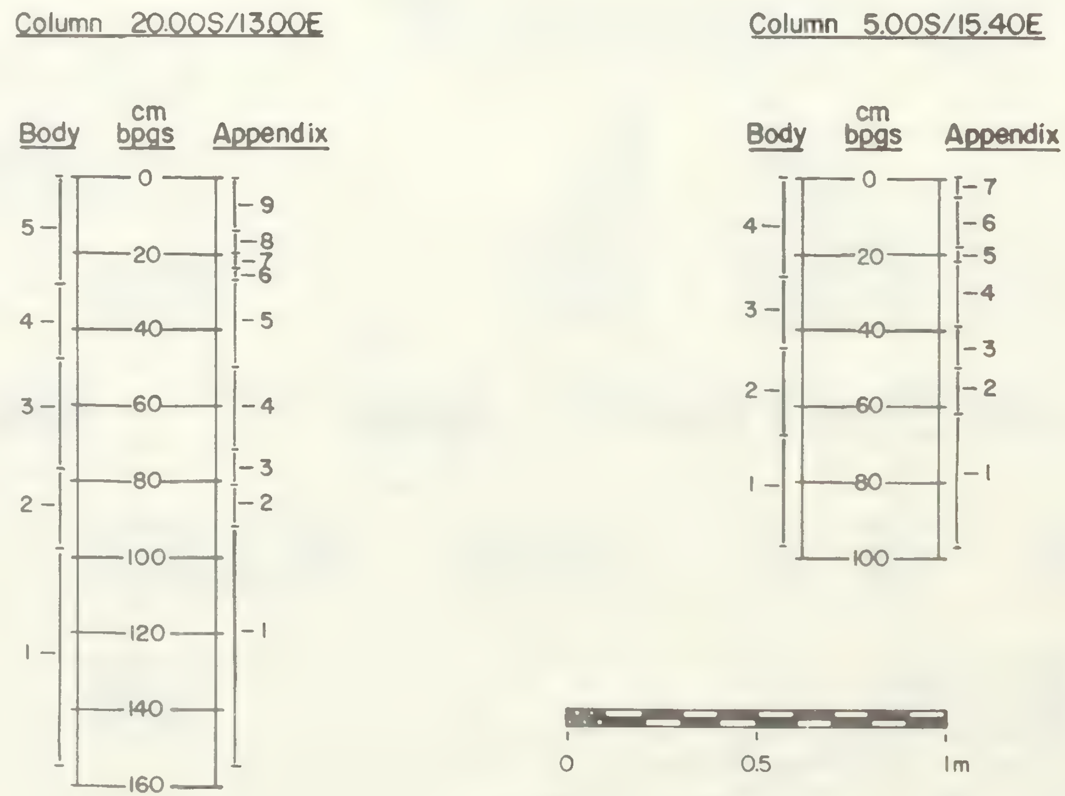

Figure 10. Correlation of field stratigraphy and Smith's stratigraphic units (used in the main body of this report).

The lower sand is represented in both columns, although the character of the deposits alter from one side of the depression to the other. The lower sand is descriptively poorly sorted, fine-skewed, meso- to platykurtic, fine to very fine sand in column 20.00S/13.00E and a poorly to very poorly sorted, coarse to strongly coarse, skewed, lepto- to very leptokurtic, medium to fine sand in column 5.00S/15.40E. The variation between the two is a result of placement and the frequency and intensity of deflation intervals. Reliable correlations are possible because of other factors the deposits have in common. Both are marked by numerous paraconformities in the lower deposits and share equivalent quantities of dissolved salts and free carbonates, minor but consistent variation in pH values, and position in relation to other pedogenic developments. Stratum 1 (GL No.s 174-185) of 20.00S/13.00E and Strata 1-4 (GL No.s 137-152) of 5.00S/15.40E represent this depositional unit. It is obvious that it represents at least two distinct depositional periods. One is previous to ca. 5200 B.P. and the second is sometime later but before ca. 2800 B.P.

The upper sand is better represented in Column 20.00S/13.00E, with depth approaching 1.0 m. Column 5.00S/15.40E, however, has only ca. 20 cm of deposits descriptively part of the upper sand. Again, there are differences in the particle populations and these relate to position in the dissection feature in relation to predominant winds. In column 20.00S/13.00E, the upper sand is a moderately well sorted (trending toward poor), fine to strongly fine skewed, leptokurtic fine sand. In column 5.00S/15.40E, the upper sand is a very poorly sorted, fine skewed, mesokurtic fine sand. All of these deposits are thought to postdate 3200 years B.P. In column 20.00S/13.00E, the upper sand is represented by Strata 2-9 (GL Nos. 153-173) and on column 5.00S/15.40 by Strata 5-7 (GL Nos. 132-136). A conspicuous organic carbon peak is notable in both columns, which represents an early Medithermal paleosol. In column 5.00S/15.40E it appears at ca. 20 cm below the surface (GL No. 135, 136; Strata 5) and in column 20.00S/13.00E the peak is between 65 and 80 cm below the surface (GL Nos. 167-170; Strata 3 and lower Strata 4). A similar soil development that is roughly time equivalent (between ca. 2500 and 1200 B.P.) was noted on 48LN1469 about 7 km to the northwest.

Besides the gross interpretation given above, a more discreet depositional history is apparent in detailed study of the various strata and their relationship to subjacent and superadjacent strata. In column 20.00S/13.00E, nine strata were defined in the field profiles. Stratum 1, it was noted, represents the early (i.e., pre-Medithermal) deposition and pedologic development. This is the lower sand. Strata 2 through 9 are the components of the upper sand. While they are uniform in consideration of the mode of deposition, they vary somewhat depending on what environmental influences, or better, geomorphic processes acted upon them. Strata 2 (GL No. 171-173) of column 20.00S/13.00E represents a transition between Strata 1 and 3 (GL Nos. 171-173 and GL Nos. 169, 170) and is similar for the most part to Strata 3 (compare GL Nos. 171-173 of Strata 2 to samples from Strata 1 and 3 on Figure 3). Strata 2 and 3 represent one depositional cycle from erosion at the lower boundary of 2 to stabilization and soil formation at the top of 3. A slight decrease of mean size, a slight increase in clay content, and a slight increase in free carbonates below the Strata 3/4 contact also indicate this was a slight eluvial development. Only light evidence is presented for a paraconformity on this contact, notably increase in mean particle size and a slight deficiency in silt/clay particles; nevertheless, one is present. From the relative positions of the paraconformity and peaks in organic carbon, the surface at the upper contact of Stratum 3 was stable for a period of time.

Stratum 4 (GL Nos. 164-168) of column 20.00S/13.00E is another shadow type aggradation with significant organic content that is truncated at the upper contact by a paraconformity analytically similar to the one noted that occurs at the top of 3. The paraconformity rests on an eluvial zone, and nearly every variable indicates a significant change across the Strata 4 and 5 boundary (GL Nos. 163, 164). Wider fluctuations of skewness and kurtosis, deficiency of clays and silts, increased mean sizes, and better sorting above this contact (i.e., in Strata 5, GL Nos. 159-163) indicate that 5 is an active eolian phase, or drought.

Strata 6, 7, and 8 (GL Nos. 158, 157, and 156 respectively) represent a rapid deposition during a short-term pluvial and have an associated soil development. They are separated from Strata 9 above by another paraconformity, and Stratum 9 is another aggradation phase that fines upward. Fining upward is indicative of transition to a pluvial period. The increase in carbonates and the associated peak in conductivity at ca. 15-25 cm below the surface shows modern illuvial deposition.

Two cultural components (III and IV) were present in the area of the site where column 20.00S/13.00E was drawn. Component III occurred in Stratum 2 and temporally occurred during the first Medithermal pluvial. Component IV occupations occurred during the second or middle pluvial of the Medithermal, apparently a period of increased activity at the site as Components III, V, VI and VII are associated, in other parts of the site, to sediments of this pluvial.

Column 5.00S/15.40E is not nearly as complicated as column 20.00S/13.00E. The gross definition separates the column into upper and lower sands. Stratum 1 (GL Nos. 146-152) is a mobile deposit and Stratum 2 (GL Nos. 143-145) is a transition to wetter times. Stratum 3 (GL Nos. 141, 142) is the culmination of this wet period. A slight organic peak across the Strata 2/3 boundary is notable.

Stratum 4 (GL Nos. 137-140) is only slightly different from 3 and was mapped in the field on the basis of color. It contains an eluvial development in its upper portion; is capped by an organic soil horizon (Stratum 5, GL No. 136), which has been partially eroded; and has a paraconformity above.

Strata 6 (GL Nos. 133-135) and 7 (GL No. 132) represent late Medithermal and recent deposits that coarsen upward, attesting to the more frequent deflation of this portion of the site.

Components I and II were present in the area of the site where column 5.00S/15.40E was drawn. Component I rests on the paraconformity that separates Strata 1 and 2 and is situated in 2. Temporally the occupation occurred at 5290 B.P. in the first pluvial of the Neoglacial. Component II is stratigraphically located in the top of Stratum 4 and probably occurred in the third, or last, major pluvial of the Neoglacial.

Source Locations

Mineralogy was completed on samples from the Taliaferro site. The sediments were composed of monocrystalline quartz; plagioclase; potassium feldspars; and minor constituents of the more easily weathered hornblendes, pyroxenes, and biotites. This material was derived from either or both the Laney member of the Green River Formation or the Bridger Formation (M. Eocene). These two stratigraphic units are coeval and are representative of a period of basin filling that eradicated Eocene Lake Gosiute. The material was transported into the Green River Basin by ancient river systems draining an area in northwest Wyoming, i.e., the Absaroka plateau (Koenig 1960).

Geomorphology

The Taliaferro site is in a late Pleistocene drainage dissection feature relic of generally wet climatic conditions. With the advent of the typical Holocene climates, this feature began to accumulate eolian deposits. Age of the deposits is not directly known but can be inferred to predate ca. 9500 years B.P. based on analogy to 48LN1658 (Miller and Bower 1986) a few kilometers to the northwest in the trunkline corridor. The oldest radiocarbon age at the Taliaferro site (5290 ± 190, Beta-13013) was obtained from Component I in the north half of Excavation Area A. Descriptively, all the deposits sampled are eolian based on population curves and represent both shadows and true dunes. The deposits were active prior to ca. 5290 as evidenced by the fluctuating values of skewness and kurtosis. It is unknown if this represents continual dune encroachments into the feature, which is likely the case in column 5.00S/15.40E, or alternate periods of shadow aggradation and deflation, which is more apropos for equivalent age strata in column 20.00S/13.00E. Preservation, or less overall erosion, is featured in 20.00S/13.00E, which is due to the topographic high bounding the dissection feature on its south side.

These deposits were periodically subjected to pedogenic developments, and the most noticeable are illuvial and eluvial horizons. Illuvial horizons are represented by vertically limited increased clays and silts translocated from upper horizons in the ped. Eluvial developments represent subsurface weathering of the mineral constituents, which varies according to effective soil moisture, temperature, and the minerals present. These are commonly apparent with the combination of increased silt/clay percentages, increased free carbonates, and decreased mean sizes. Eluvial horizons represent a cumulative effect. For instance, weathering in the horizon for a thousand years may produce a three to five percent increase in clay- and silt-sized particles. With burial and a subsequent wetter period, the recently emplaced upper strata, in a thousand years, will produce a 3-5% increase of these particles. In the lower strata, the new development is in addition to the previous one, yielding a net increase of 6 to 10%. In column 20.00S/13.00E this is evident. Deposits above Component IV (Strata 5-9; GL Nos. 153-163) average about a 6% clay/silt content; this is considered the base amount of these particles that are contributed to the deposits from the source. Between Components IV and III (Strata 2-4; GL Nos. 164-173), the content increases to an average of about 10%. Another horizon below Component III (upper Stratum 1; GL 174-179) contains an average near 15%, and the lowest horizon (lower Stratum 1; GL Nos. 180-185) contains an average of ca. 20%. Similar developments are notable in column 5.00S/15.40E, though not to the same degree. As explained previously, the latter column was in a shallow portion of the depression on its northern side. In that position, it was subject to greater erosion, less deposition, and probably realized greater evapotranspiration relative to the quantity of available stored soil moisture. The base level of fines in the upper, unmodified sediments here (Strata 7, upper Stratum 6; GL No. 132, 133) is about 7% (compared to 6% for column 20.00S/13.00E). Subsequent developments are ca. 8 (Stratum 5, lower Stratum 6; GL No. 134-136), 10 (Stratum 3, 4; GL No. 137-142), and 12% (Stratum 2; GL No. 143-145) (compared to 10, 15, and 20% respectively in column 20.00S/13.00E). Illuviation seems to dominate eluviation at 5.00S/15.40E, and eluviation dominates illuviation at 20.00S/13.00E. Paraconformities (deflated surfaces) commonly cap illuvial/eluvial horizons as these indurated deposits form the erosional base for deflation after development. Paraconformities are most commonly indicated by trends toward coarse skewness and platykurtosis with increased mean sizes coupled with noticeably poorer sorting.

Stereonet Analysis of Component I

A Wulff equal angle stereonet (Figure 11) was applied to derive trends of natural erosion on the Component I floor in Excavation Area A. One hundred twenty three pieces of thermally-altered rock with a tabular shape were subject to attitude and dip measurements and provenienced to 2 x 2 m grid units. Table 5 gives this data. Figure 12 shows the plot of these data points, Table 6 lists the derived trends and percent correlation of the trends, and Figure 13 shows the derived trends superimposed on an outline of Excavation Area A (north half). Figure 14 is the interpretation of these trends.

These trends were grouped into three categories indicating the degree of correlation within the specified populations. Greater than or equal to 50% correlation is considered a strong trend, 33% to 49% is considered moderate, and less than 33% correlation is considered weak. From this data, the following interpretation is offered.

The difference in elevation from west to east is about a meter and decreases to the east. This is derived from the topographic map of the site (see Figure 4) and from the stratigraphic profiles. This probably mirrors the bedrock surface of the dissection feature of late Pleistocene times, the depth of which limited the depth of subsequent eolian deposition. It is apparent from the position of the numerous "domes," that the surface was hummocky at the time of occupation (Component I). This general appearance is evident of active eolian deposits. These deposits, when stabilized in a wetter interval (in this case the early Neoglacial of Miller 1986a), were subject to pedogenic developments, notably eluviation and illuviation. Eluvial and illuvial horizons form the base for subsequent deflations; the domes represented by divergent trends, therefore, indicate the position of high points within the dissection feature. The large form in the northwest area of the block (see Figure 14) represents, in all likelihood, a longitudinal ridge. This is supported by the sedimentology of Stratum 1 of column 5.00S/15.40E which was taken from this feature. Intermediate-sized forms in the southeast and southwest are perhaps the position of dome dunes, and the five smaller domes in the southern part probably represent coppice dunes. The actual surface of occupation was as much as 20 to 30 cm above where the material was recovered. This is the common depth of development of the modern illuvial/eluvial horizons: in column 20.00S/13.00E this development is noticeable at a depth of ca. 18 to 25 cm (GL Nos. 156-158).

The dips of derived trends vary between 8° and 70°. Some assumption must be made as to the meaning of these dips. Dips of less than 20° probably represent unmodified shadow areas, which were probably aggrading slowly at the time of Component I occupations. The gradient of the shadows, evidenced by the profiles, varied between 10° and 15°. This dip is an apparent dip; true dip is slightly more, i.e., up to 20°, when the line of dip is placed perpendicular to the "strike" of an aggrading deposit. Dips between 20° and 30° represent either the formation of eluvial horizons under slip faces or rill erosion. Dips greater than 30° represent rill erosion. As the true elevational difference was no greater than about 1.0 m, rill erosion is the only explanation for these steep dips. These observations are supported by the distribution of strong, moderate, and weak trends in the block area. Strongest trends (correlations greater than 50%) are in the western two-thirds

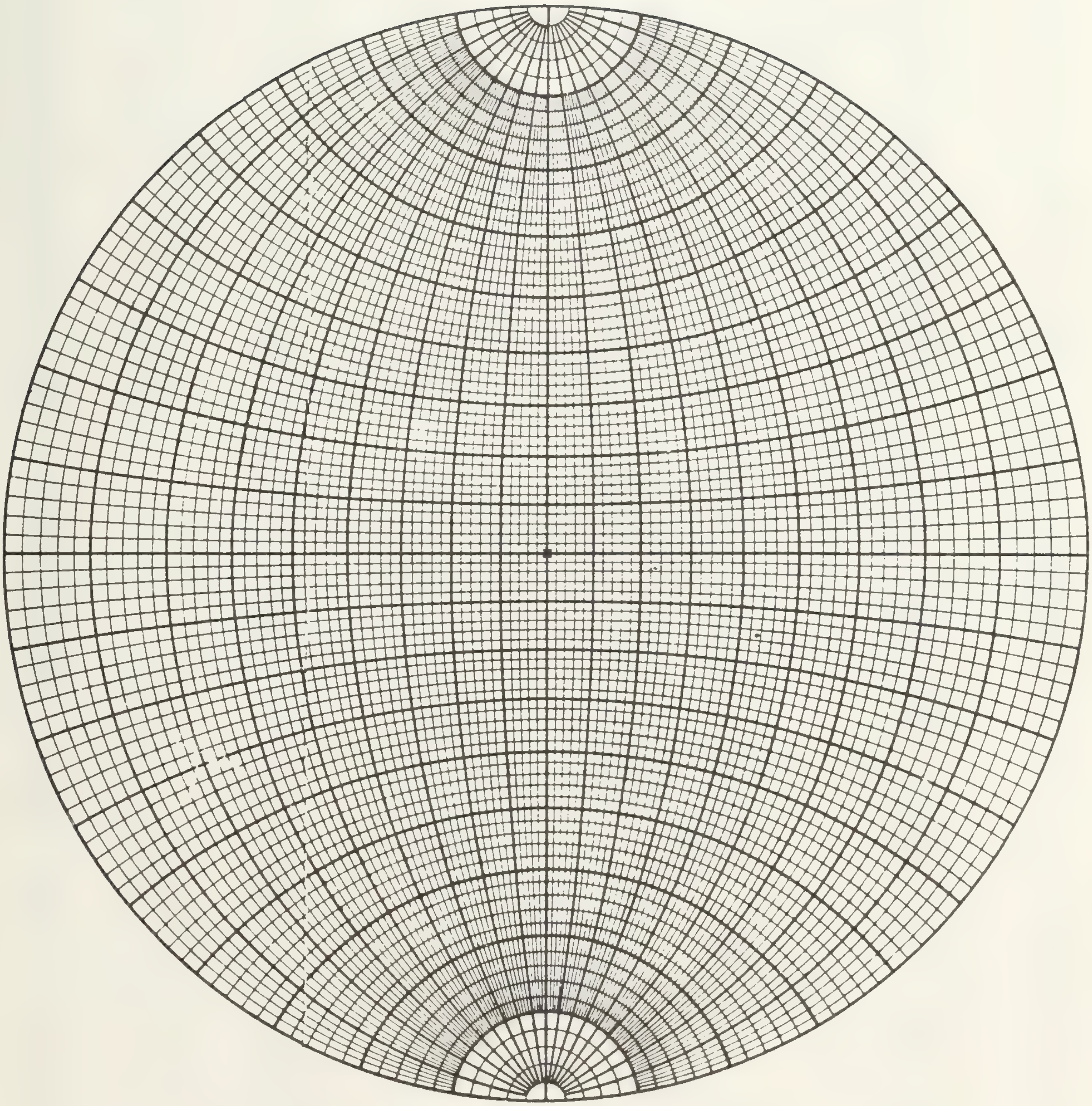

Figure 11. Wulff Equal Angle Stereonet. Taken from AGI (1982; AGI Data Sheet 54.2).

Table 5. Attitude and dip data from thermally-altered rock from the Taliaferro site (48LN1468), Component I.

No.	Provenience	Attitude	Dip	No.	Provenience	Attitude	Dip
1	5S/13E	57E	28SE	48	11S/13E	40W	30NE
2	5S/15E	61E	19NW	49	11S/13E	28W	9SW
3	5S/15E	82W	22S	50	11S/13E	88E	16S
4	5S/15E	14W	16E	51	11S/13E	16E	17SE
5	5S/15E	4W	11W	52	11S/13E	68W	22SW
6	5S/15E	88E	33S	53	11S/13E	85E	36S
7	5S/15E	69W	36N	54	11S/15E	50E	6NW
8	5S/15E	66E	51SE	55	11S/15E	70W	50S
9	5S/15E	3E	25W	56	11S/15E	50W	21NE
10	5S/15E	11E	12E	57	11S/15E	12W	16E
11	5S/15E	2W	16W	58	11S/15E	N	43E
12	5S/19E	33W	5W	59	11S/15E	86E	11S
13	5S/19E	5W	13NE	60	11S/15E	74W	14S
14	7S/11E	25W	4NE	61	11S/15E	30E	26SE
15	7S/11E	14E	24NW	62	11S/15E	E	15S
16	7S/13E	40W	16SW	63	11S/15E	78E	14S
17	7S/13E	12E	27W	64	11S/17E	61E	16SE
18	7S/13E	72W	57SW	65	11S/17E	27E	46NW
19	7S/13E	75W	46N	66	11S/17E	16E	12E
20	7S/13E	62E	27NW	67	11S/17E	54E	20SE
21	7S/13E	8E	20W	68	11S/17E	77W	36NE
22	7S/13E	E	23S	69	11S/19E	25E	4S
23	7S/17E	15W	7SW	70	11S/19E	20W	28SW
24	7S/17E	80W	13S	71	11S/19E	80E	23SE
25	9S/11E	84E	26S	72	11S/19E	19E	15NW
26	9S/11E	20W	51NE	73	11S/19E	50E	19SE
27	9S/13E	75E	11NW	74	11S/19E	22E	29W
28	9S/13E	40W	11SW	75	11S/19E	64E	9NW
29	9S/13E	65E	16SE	76	11S/19E	58W	26SW
30	9S/13E	69E	19S	77	11S/19E	68E	21SE
31	9S/13E	45W	3SW	78	11S/19E	87E	33N
32	9S/13E	52W	4SW	79	11S/21E	20W	24NE
33	9S/13E	5W	21W	80	11S/21E	4W	32E
34	9S/13E	24W	4SW	81	11S/21E	54E	16NW
35	9S/13E	27E	17SE	82	11S/21E	4E	42E
36	9S/13E	85W	16S	83	13S/13E	10E	7W
37	9S/15E	84W	26S	84	13S/13E	15E	3E
38	9S/15E	82W	15S	85	13S/13E	35E	5E
39	9S/15E	62W	9SW	86	13S/13E	24E	17E
40	9S/17E	40E	19SE	87	13S/13E	53E	10SE
41	9S/17E	65E	11SE	88	13S/15E	3E	12W
42	9S/17E	63E	6SE	89	13S/15E	57E	18NW
43	11S/11E	11E	12W	90	13S/15E	13W	6E
44	11S/11E	40E	41E	91	13S/15E	67E	7W
45	11S/11E	42W	42NE	92	13S/15E	54E	13SE
46	11S/11E	20E	26NW	93	13S/15E	14W	7W
47	11S/11E	44W	37SW	94	13S/15E	27W	4NE

Table 5. Concluded.

No.	Provenience	Attitude	Dip	No.	Provenience	Attitude	Dip
95	13S/15E	11W	4E	110	13S/19E	58E	4S
96	13S/17E	14E	36E	111	13S/19E	N	12W
97	13S/17E	16W	31E	112	13S/19E	16E	22E
98	13S/17E	84E	17S	113	13S/19E	38E	55SE
99	13S/17E	76E	38S	114	13S/19E	27W	12NE
100	13S/17E	34E	26W	115	13S/19E	65W	15NE
101	13S/17E	52W	20NE	116	13S/19E	4E	9E
102	13S/17E	12E	20W	117	13S/21E	83E	17N
103	13S/17E	57W	39SW	118	13S/21E	11E	18E
104	13S/17E	6W	7E	119	13S/21E	29E	10E
105	13S/17E	64E	34NW	120	13S/21E	12W	16E
106	13S/17E	68E	11NW	121	13S/21E	88E	42S
107	13S/17E	67W	27S	122	13S/21E	68W	14SW
108	13S/19E	35W	39NE	123	13S/21E	48E	14SE
109	13S/19E	2E	26E				

Note: All headings true; all headings in Table 6 have been corrected to magnetic.

of the area; moderate and weak trends are primarily in the south one-third. The weak and moderate trends are also convergent, i.e., they dip towards nearby trends. This would indicate that rill erosion is the primary modifier in the southern third of the area studied while eolian processes (primarily deflation) are the primary modifiers in the northern and western parts. Recall that this is the same pattern (related to eolian deposition/deflation) indicated in the analysis of the two sample columns. Column 5.00S/15.40E frequently featured deflated deposits with less well developed pedogenesis than noted in Column 20.00S/13.00E in the protected south side of the dissection feature. These observations are also supported by field observations made at the time the attitude and dip data was gathered.

Component I, as evidenced by the above discussion, was severely deflated over most of the area of the northern and western parts of Excavation Area A. Rill erosion accomplished much in the southern part of the block. The activity area analysis presented in the main body of this report suggests that two family units occupied the area excavated. This is hard to support with the present evidence. As only one of two hearth features was aged, there is no guarantee that the two "family units" are coeval. Both hearths were deflated. This only provides an end point on a time line--they were both deflated and further eroded in the same interval, but to suppose that the two were emplaced and used during the same period of occupation is unsubstantiated. The debris associated with Component I could, and probably does, represent recurrent occupations over a span of a few hundred years. As the site was subjected to deflation by ca. 4500 B.P. at the earliest (refer to Miller 1986a) and the hearth age was 5290, this gives a period of nearly 800 years in which one or more occupations could have occurred. Little in the way

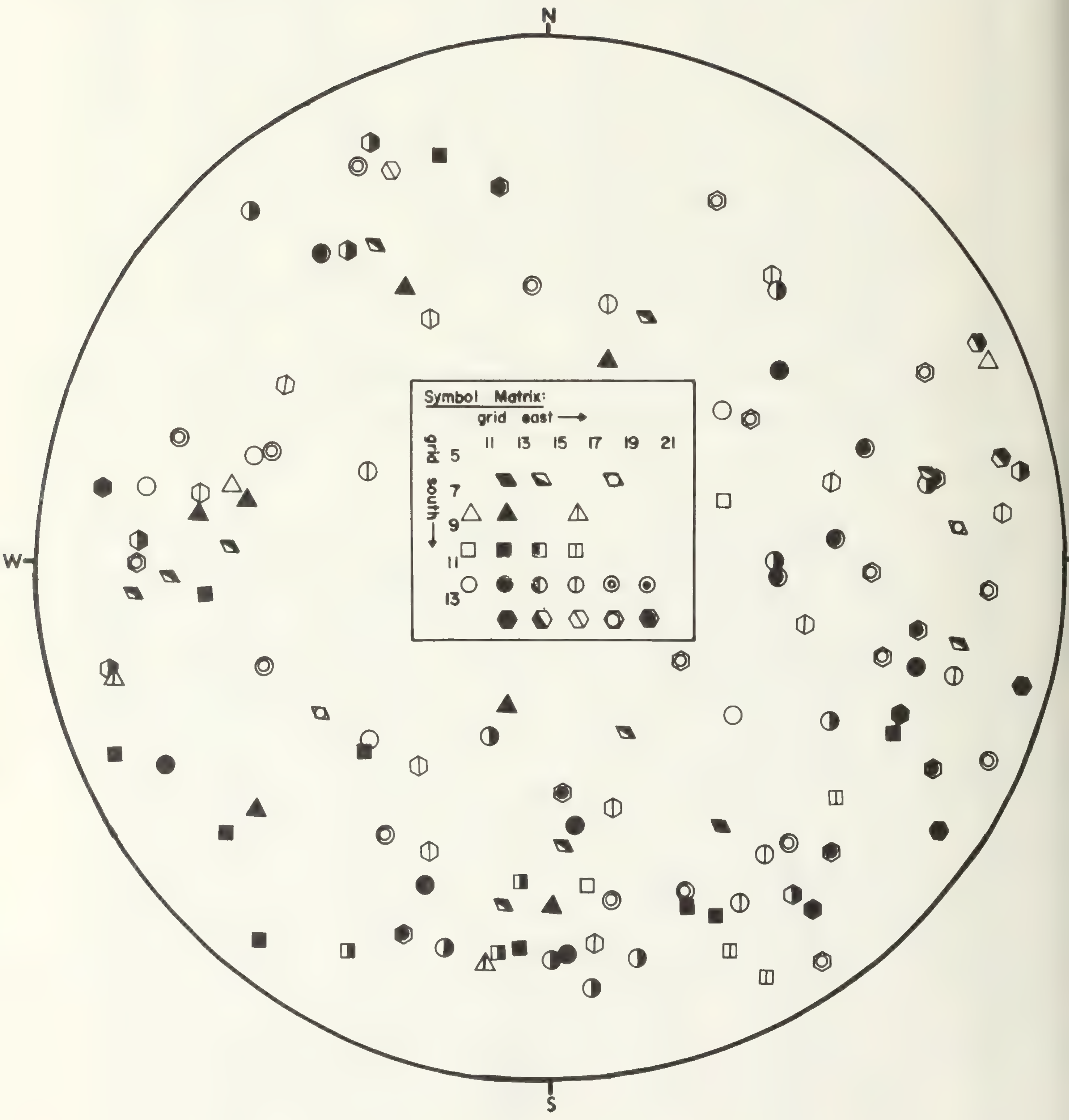

Figure 12. Plot of data points from tabular thermally-altered rock from Component I, the Taliaferro site (48LN1468).

Table 6. Derived trends from stereonet resolution and percent correlation, Component I, the Taliaferro site (48LN1468).

Units	Strike	Dip	% Correlation
Strong			
5S/19E-7S/17E	N64E	62S	75%
7S/11E-7S/13E	N55E	40N	67%
7S/11E-9S/13E	N41E	20SE	50%
7S/17E-9S/15E	N89E	14S	80%
7S/17E-9S/17E	N89W	14S	80%
11S/11E	N75E	55N	60%
9S/11E-11S/13E	N61E	30S	63%
9S/13E-9S/15E	N39E	20SE	54%
9S/13E-11S/15E	N35E	25SE	55%
9S/15E-9S/17E	N43E	20SE	50%
9S/15E-11S/17E	N40E	20SE	63%
9S/17E-11S/17E	N56E	20SE	50%
11S/11E-13S/13E	N75E	10S	60%
11S/13E-11S/15E	N31E	20SE	50%
11S/13E-13S/13E	N78E	18S	55%
11S/17E-13S/15E	N37E	16SE	54%
13S/15E	N83W	8NE	50%
13E/13E-13S/15E	N19E	10SE	62%
Moderate			
5S/15E	N68E	70N	40%
5S/15E-7S/13E	N68E	70N	35%
7S/13E-9S/13E	N67W	32SW	35%
7S/13E-9S/15E	N78E	22S	40%
9S/11E-9S/13E	N70W	30SW	42%
9S/11E-11S/11E	N52W	40SW	43%
9S/11E-11S/13E	N19E	34SE	38%
9S/13E	N9E	20W	40%
9S/13E-11S/11E	N9E	20W	40%
9S/13E-11S/13E	N39E	20SE	44%
9S/13E-11S/13E	N63E	30S	44%
9S/15E-11S/13E	N41E	20SE	44%
9S/15E-11S/15E	N31E	25SE	38%
9S/17E-11S/15E	N85W	14S	46%
9S/17E-11S/19E	N77E	27S	38%
11S/13E-13S/15E	N38E	15SE	43%
11S/15E-11S/17E	N49E	18SE	47%
11S/15E	N7W	40E	40%
11S/15E-13S/13E	N77E	15S	47%
11S/15E-13S/15E	N45E	18SE	39%
11S/15E-13S/15E	N36E	18NW	38%
13S/17E	N55E	35N	33%
11S/17E-11S/19E	N88E	35S	47%
11S/19E-11S/21E	N84E	27S	40%
11S/19E-13S/21E	N85E	27S	35%
11S/21E-13S/19E	N67W	45NE	38%
11S/21E-13S/21E	N59W	30NE	45%
13S/15E-13S/17E	N54E	35N	35%

Units	Strike	Dip	% Correlation
Weak			
5S/15E	N77W	36NE	30%
11S/15E-13S/15E	N87E	10N	28%
11S/15E-13S/17E	N48E	16SE	27%
11S/17E-11S/19E	N75W	38NE	27%
11S/17E-13S/17E	N15W	34E	29%
11S/17E-13S/17E	N63E	38N	24%
11S/17E-13S/19E	N60W	40NE	29%
11S/19E-11S/21E	N37E	55SE	29%
11S/19E-13S/17E	N53E	35NW	27%
11S/19E-13S/19E	N25E	28SE	26%
13S/13E-13S/15E	N16E	10NW	31%
13S/15E-13S/17E	N30E	10SE	25%
13S/15E-13S/17E	N85W	10NE	30%
13S/17E-13S/19E	N75W	15NE	29%
13S/19E-13S/21E	N1E	17E	25%
13S/19E-13S/21E	N23W	10NE	25%

Note: All trends have been converted to magnetic for use on the diagram in Figure 8.

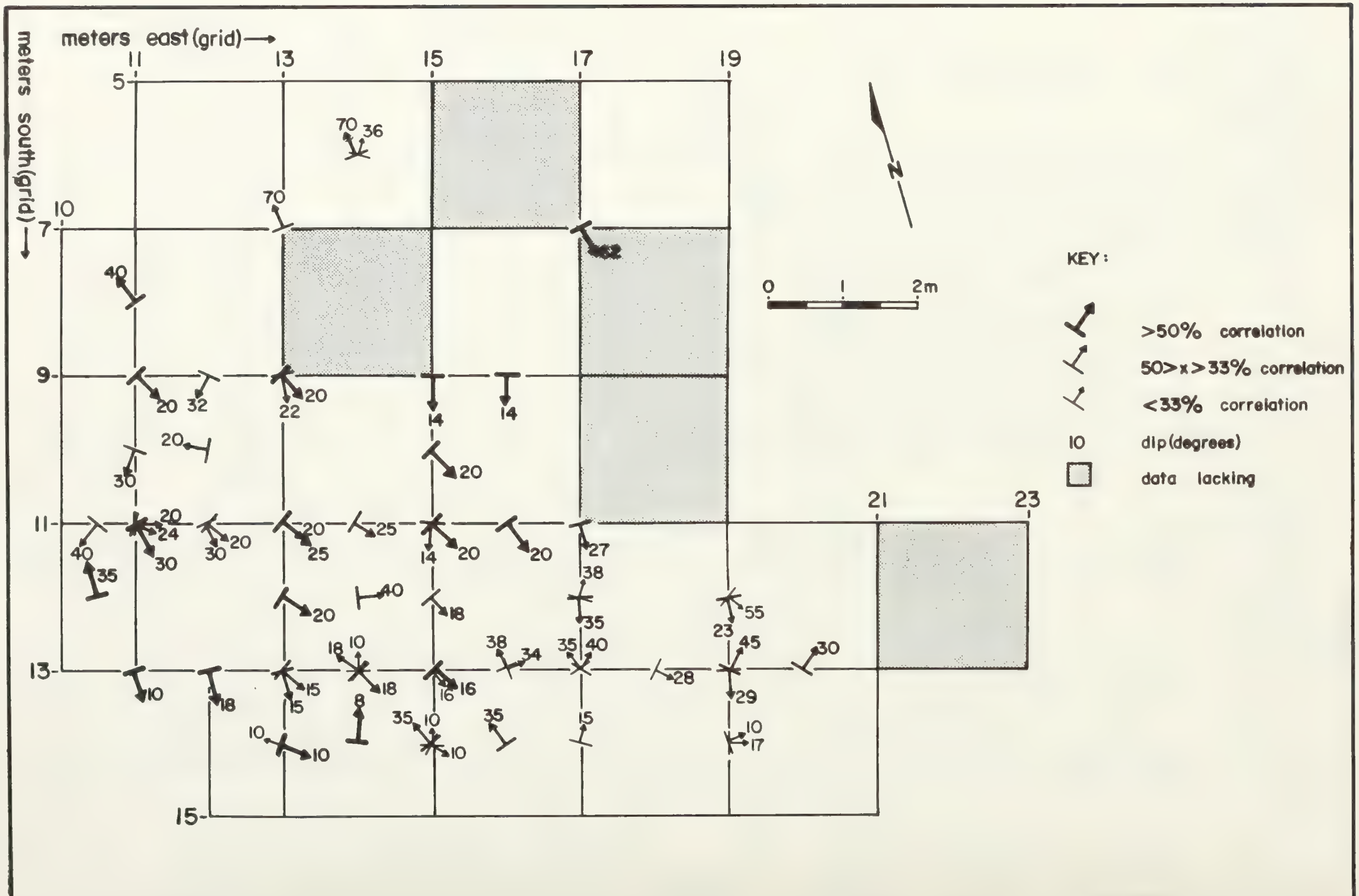

Figure 13. Derived trends from attitude and dip data of thermally-altered rock from Component I, the Taliaferro site (48LN1468).

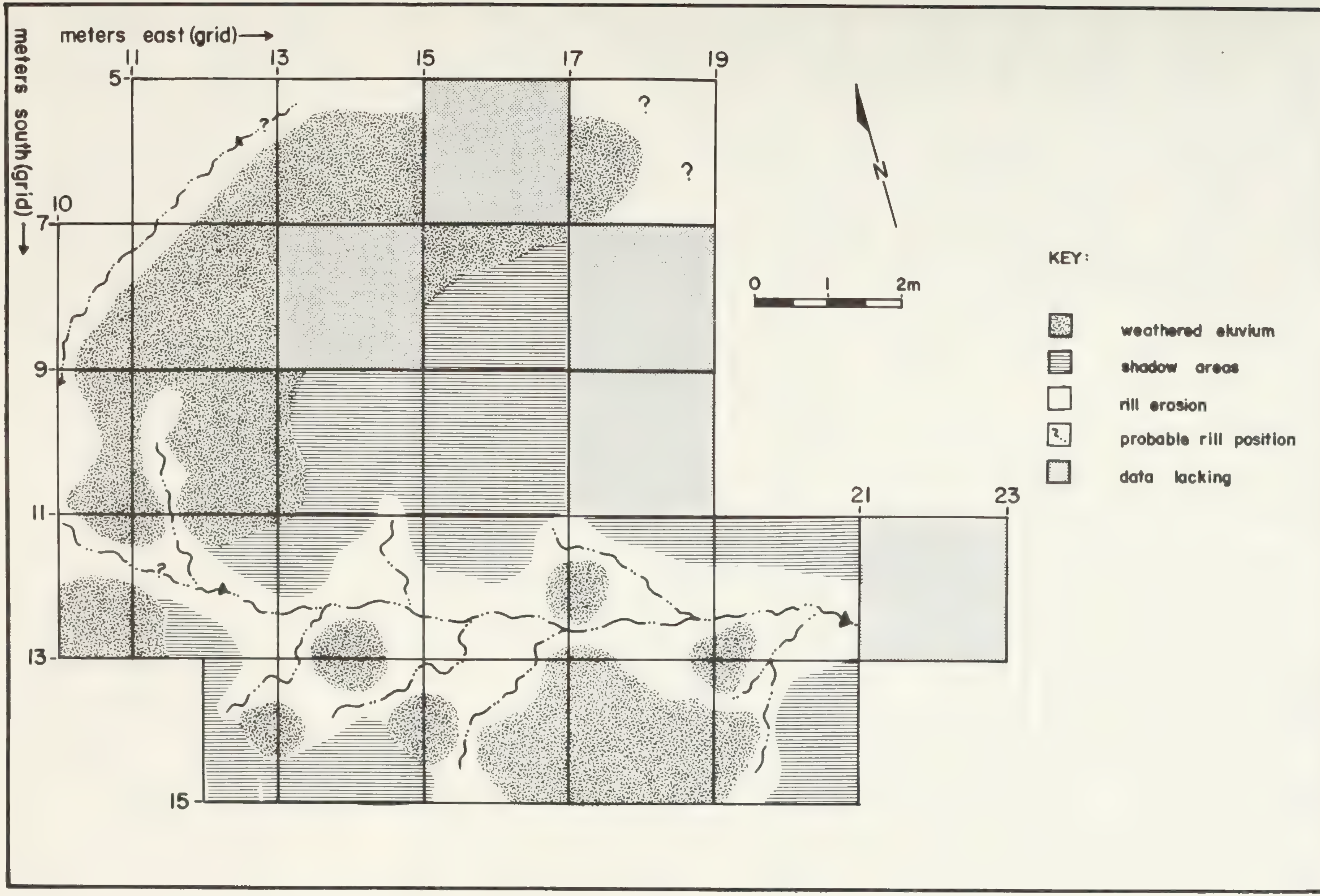

Figure 14. Interpretation of derived trends from Component I, the Taliaferro site (48LN1468).

of eolian deposition could occur at the time as this particular interval was a wet/cool one. During wet/cool intervals, eolian deposition, though not stopped, proceeds at a very slow pace. When deflated, as much as 30 cm of material is removed, dropping the cultural debris on previously formed eluvial/illuvial horizons. In this way, several recurrent occupations come to rest on the same surface. Unless the features are protected from erosion, no direct correlation can be made between them. The features present in Component I were both eroded, and it is unknown when, in relation to each other, the two were constructed (see Miller 1986b).

However, some useful information is presented from general observations of the reconstruction of the geomorphic features present inside the dissection feature. The nature and distribution of these features perhaps indicates the preference in settlement and distribution of activities in relation to these features. For the Component I occupation or occupations, some interesting relationships are evident (compare Figures 25 and 26 in the main body to Figure 14, this appendix). The inhabitants of Component I favored interdunal areas within the dissection feature for most tasks, including tool production and food processing. The reason for the preference is unknown, but it could vary from simple environmental preference to camouflage. The latter does not imply "defense." Projectile points, found also in the interdunal areas, are present along the longitudinal dune. Perhaps this area offered an excellent view of the local area and hunters worked there while watching for game.

The above comments concerning the integrity of the Component I cultural debris does not wholly apply to the other components at the site. Component I was undoubtedly the most severly eroded of all components contained in the site. Later components (with the exception of II) were contained in wet period shadow aggradation deposits and in the analyzed columns, there is no evidence that would indicate any great degree of erosion. While caution is advised in the acceptance of the two-family unit reconstruction for Component I, the activity area analyses of the other components are certainly more valid and useful. It is fortunate, perhaps, that Component I was selected for the stereonet application. It proved to be a useful tool for the reconstruction of the geomorphic features on the site around the time of the Component I occupation. It provided specific details of prehistoric preference as well. And lastly, it served to illuminate some of the problems in applying present theory of activity area analysis to cultural deposits beyond the limits of ethnology and ethnography. More detailed definition of site stratigraphy will be required before any success can be obtained in these types of analyses.

Paleoclimatic Interpretations

It is unknown when the first eolian deposits were left in the late Pleistocene dissection feature. By analogy to 48LN1658 (Miller and Bower 1986), the first deposit and arid interval probably predates 9500 B.P. After this time, the regional climate became characteristically arid and warm during the Altithermal droughts. The climatic history of the Taliaferro site reported here starts in the late Altithermal period of Miller (1986a), and the following discussion will be in reference to that model (see Figure 9).

In the Altithermal, mobile eolian deposits moved along the ridge upon which the site is situated and into the dissection feature of late Pleistocene age. Once stranded there, the eolian deposits, for the most part, could not be eroded or deflated to any great degree. Inferred winds are from the southwest. These deposits were extensive in the depression and still represent about 40% of all the deposits in the feature.

Deposits of this age are well represented throughout the western Wyoming Basin and are by far representative of a period of great aridity. Their mobile character is commonly indicated, even in shallow deposits, and throughout the interior basin areas vast dune fields were formed. It is doubtful that any arid event since had as great an effect on geomorphic processes as did the Altithermal. Eolian deposits of this age are present in 48LN1469 (McKern 1987), 48LN1296, 48LN1404, and 48LN373 (Wheeler et al. 1986) locally. Mobile deposits of this age constitute the thickest eolian unit. In the upper/lower sand split that is noticeable, Altithermal and older deposits are always the lower unit.

Around 5500 years B.P., the climate became wetter with the onset of the first of the Neoglacial pluvials. Site deposits were stabilized, and eluvial/illuvial deposits began to form. Component I occupants used the area during the first pluvial. By ca. 4300 years B.P. the site was deflated again, and this was repeated ca. 3000 years B.P. at the end of the Neoglacial. Very shallow aggradations were likely featured during pluvials. Component II represents an occupation(s) occurring at the end of the Neoglacial, between ca. 3200 years and 2850 years B.P. This is also the placement of part of Component III.

Neoglacial deposits are rather limited. During the period, the local drainages were downcutting and eolian processes were limited. While dome type dunes may have formed and moved intermittently during the minor interpluvials, eolian deposition ceased or nearly ceased and shallow aggradation in shadows may have been the only deposition notable. The most noticeable aspect of Neoglacial deposition is the dual pedologic, or secondary deposits, of eluviation and illuviation. When the upper/lower sand scheme is applicable, it is actually these secondary developments that formed in the primary deposits of Altithermal (and older) age that are key to definition of the lower sand. As no appreciable deposition is notable, the interpluvials of the Neoglacial are harder to delimit but cluster in three periods. At the Taliaferro site, the earliest is indicated by Component I. During a brief interpluvial, some sites feature a second, albeit minor, aggradation which serves to delimit the secondary pluvial of the Neoglacial. The associated illuvial/eluvial development is slightly weaker. Seldom is it separated from the first pluvial, or the third pluvial for that matter, by more than 10 or 15 cm. Locally, 48LN1296 and 48LN373 (Wheeler et al. 1986) and 48SU939 (Miller and Bower 1986) contained horizons aging to this event. The third pluvial of the Neoglacial is usually represented by the end of the well developed illuvial/eluvial developments. Component II at the Taliaferro Site occurred during this pluvial as did the early occupation of Component III, the single component reported from 48LN1469 (McKern 1987), a component from 48SU939 and 48LN919 (Miller and Bower 1986), and numerous other components locally and in the western Wyoming Basin.

The character of the Medithermal climate is quite unique compared to the Late Glacial and Neoglacial, which were extremely wet, and the Altithermal, which was extremely dry. The general climate was widely fluctuating in more than one obvious cycle. Although three predominantly pluvial periods are notable, there are smaller climatic fluctuations evident within at least the first two of the pluvials. Component III from the Taliaferro site produced two radiocarbon ages that bracket the first pluvial of the Medithermal: 2590 and 1910 years B.P. Within this range, other minor pluvials are distinguishable. Most common are two that date to ca. 2400 and ca. 2200 B.P.

Many sites in the vicinity of the Shute Creek Gas Plant (see Wheeler et al. 1986) contained one or more of these minor pluvial events. The second pluvial of the Medithermal exhibits even a greater number of minor fluctuations; a minimum of six are suspected. Component IV (aging ca. 1500 B.P.) and Component VII (aging ca. 960 B.P.) from the Taliaferro site bracket this period of generally wetter but widely fluctuating conditions. The fluctuations seem to cycle every one hundred years or so with the earliest at ca. 1500 years B.P. and successive events at 1400, 1300, 1200, 1100, and 1000 near the basin interiors. At least four of these are represented with occupations at the Taliaferro Site in Components IV through VII. Many sites locally have components dating to one or more of these minor pluvials. Site 48LN1657 contained a single component in the first minor pluvial (Miller and Bower 1986), 48SW1242 contained components aging to the first and third of these pluvials, and site 48LN373 contained evidence of all the pluvials noted (Wheeler et al. 1986). It is possible that they were all present in Area B of the Taliaferro site. In the field it was noted that at least six pluvial/ interpluvial cycles were present (based on the position of paraconformities) in Smith's Stratum 2 (see Figure 14 in the main body of this report). The third pluvial of the Medithermal occurred ca. 600 to 400 years B.P. and is not usually a distinct deposit of its own. Usually it is with or on top of the deposits of the second Medithermal pluvial period.

When initially inspected, the eolian deposits on the Taliaferro site were stabilized, indicating that the present climate is more mesic than most of the Medithermal. The label "Recent" has been applied as other evidence (see Miller 1986a) indicates this period is becoming increasingly wetter. The most striking evidence of this new pluvial is rejuvenation, downcutting, and valley widening on Slate Creek and also on Dry Piney Creek west of LaBarge, Wyoming, at 48SU867 (Thompson 1987). Other intriguing evidence was obtained in a recent visit to 48CR4419 (Thompson n.d.) where it was noted that the deposits of the second pluvial of the Medithermal were buried by recent fluvial/ alluvial deposits. A similar finding was observed at 48UT1186, south of Evanston, Wyoming (McKern n.d.).

APPENDIX G

MAGNETOMETER SURVEY

By J. H. Hathaway

INTRODUCTION

The magnetometer survey of the Taliaferro site was conducted by the Archaeometric Laboratory at Colorado State University (CSU). The survey preceded intensive archaeological excavations on the site and was anticipated to assist in the location and identification of subsurface cultural features and activity areas within the boundaries of the survey grid. One 20 x 20 m block was established within the most dense surficial artifact and fire-cracked rock scatter. A second grid was established to the northeast of the first block in an area containing minimal cultural material and was employed as a control unit for comparison of noncultural magnetic anomalies typical of the area (Figure 1).

The survey was conducted in March 1985 by CSU consultant Holly Hathaway and AS-WWC crewperson Patrick Bower. Both blocks were surveyed at 0.5 m intervals at a sensor height of 0.5 m above the ground surface. Six anomalies of potential archaeological interest fell within the AS-WWC excavation block (A). Archaeological investigations revealed fourteen features within the magnetometer grid. All but two of the features were smaller than one square meter. One of the larger features is believed to represent a midden area and measured 6 x 8 m; the other feature measured 2 m in diameter and consists of a large basin with dark fill. Only one anomaly was found to be associated with a cultural feature. Apparently, either the magnetic susceptibilities of the A horizon did not enable sufficient contrast when enhanced by cultural activities, or the type of cultural activities conducted on this site were not of the sort which result in magnetic enhancement of the soil structures. The second alternative is likely as most of the features were not accompanied by soil changes indicative of heating activities. Interpretation of the magnetic data was further complicated by changes in the magnetic concentrations in the underlying desert pavement.

PRINCIPLES OF MAGNETOMETER SURVEYING

Magnetometer surveying is a passive geophysical technique employed by archaeologists for the identification and location of subsurface cultural features. The technique requires no disturbance of the site elements or of the natural settings surrounding the site. The method entails measurement of the local geomagnetic field over a present grid of regular units. The magnetic information measured on a site reflects complex interaction between several different sources: geological, archaeological, geomorphological, or pedological. It is the task of magnetometer specialists to isolate the magnetic anomalies caused by past cultural activity from those caused by other nonarchaeological sources. The cultural activities generally result in very subtle changes in the total geomagnetic field.

The Earth's Magnetic Environment

The dominant component measured over a site is that of the Earth's dipole field; all other influences represent smaller (localized) perturbations of this main field. The Earth's field is a vector quantity and can be described in terms of inclination, declination, and intensity. The inclination represents the angle of the "dip" of the geomagnetic field from horizontal; the declination represents the angle of the geomagnetic field away from the geographic pole; and the intensity represents the strength of the geomagnetic

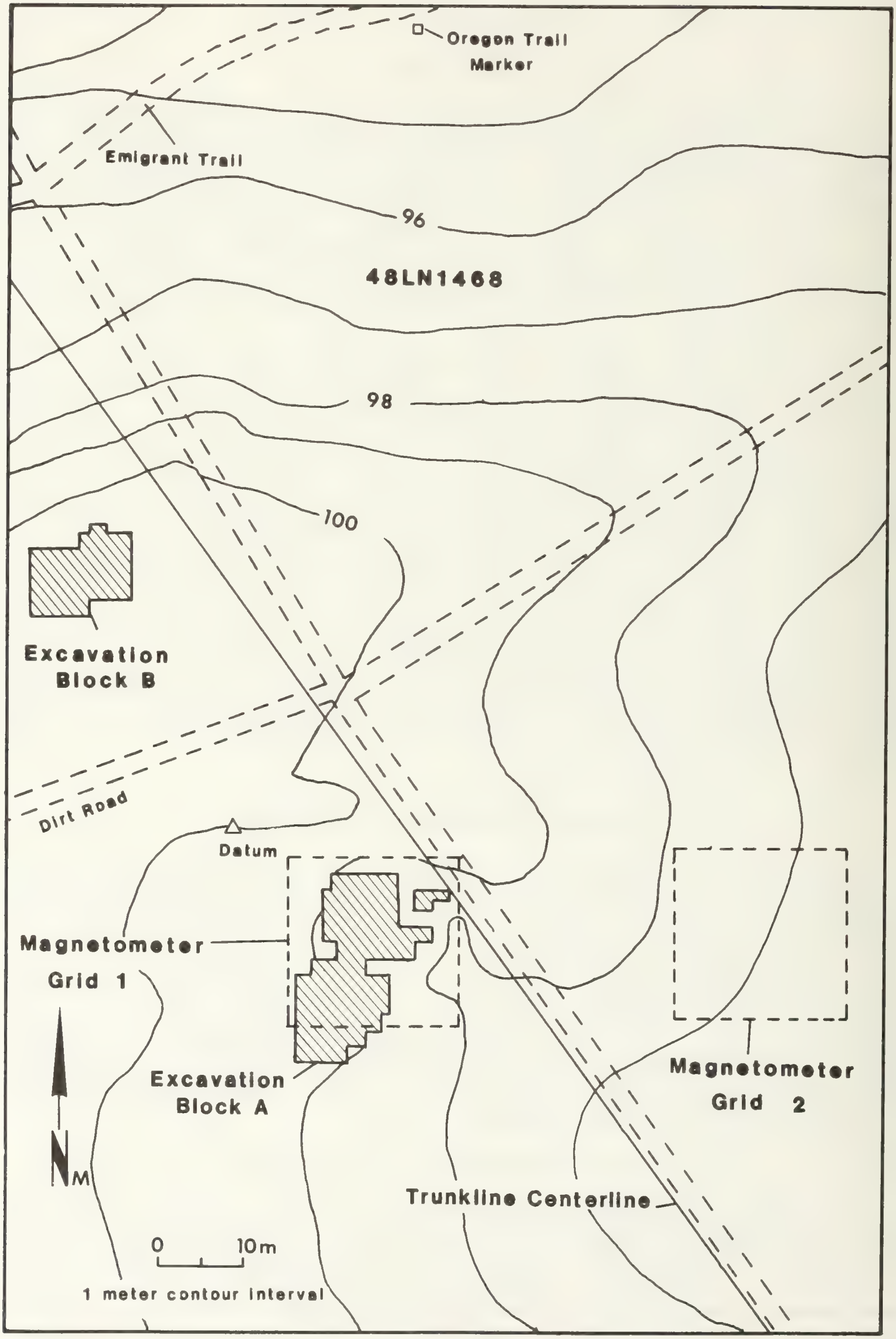

Figure 1. Map of the Taliaferro site showing the location of magnetometer search squares.

field. It is the intensity of the geomagnetic field which is the primary concern in magnetometer surveying. Although the geomagnetic intensity can vary a great deal over large geographic regions (e.g., over the United States the intensity ranges between 45,000 and 60,000 gammas), local changes are much smaller and typical variation over an archaeological site might range from 25 to 1000 gammas (depending upon other factors influencing the geomagnetic field).

Local anomalies of the geomagnetic field can occur near sources of intense magnetism, such as igneous rock formations or volcanic areas. The area affected will depend upon the size and intensity associated with the source. Topographic and geological formations not associated with high quantities of mafic material will produce less intense, regional perturbations. Other sources of magnetic interference may be found in the form of recent human introductions to the magnetic environment; for example, barbed-wire fences, electrical wires, transformers, and the like.

Fluctuations in the Magnetic Environment

Regular and irregular fluctuations occur in the geomagnetic field which require monitoring for a successful magnetometer survey. Diurnal variation is a regular, cyclical fluctuation of the magnetic field which occurs on a daily basis. In northern latitudes, the typical diurnal variation results in higher intensities in the morning and late afternoon and lower intensities during the noon hours (Breiner 1973:7). Twenty to fifty gamma changes might be recorded over an 8-10 hour workday. Magnetic storms are occurrences which are less regular. These irregular oscillations of the geomagnetic intensity have been related to the activity on the sun (solar flares and sun spots). During such storms, spikes of 50-150 gammas (Breiner 1973:7) might be recorded over several seconds, adding, therefore, considerable unwanted variation to measurement of the field during a "spike." It is best not to collect data during these periods, which may last hours or days. It is possible to obtain predictions of such occurrences from agencies like the National Oceanic and Atmospheric Administration and thereby avoid the necessity of data collection during magnetic storms.

Magnetic Anomalies

A magnetic anomaly is a local perturbation in the Earth's field which exhibits a magnetic contrast of intensity to surrounding areas. Anomalies may be of any shape, size, or amplitude, but are considered to be one of two general forms: monopolar or dipolar. Monopolar anomalies are those which have contrasting higher or lower intensities when compared to surrounding areas. Dipolar anomalies are those which have, closely associated, both a lower and a higher intensity area.

The cause (or source) of a magnetic anomaly may involve multiple factors: geomorphological, geological, pedological, and/or cultural. Isolation of the anomalies produced by cultural factors is sometimes difficult in environments of large intensity gradients. The effect of any cultural activity on the magnetic environment is dependent upon the ration of magnetic noise caused from nonarchaeological sources (e.g., geological formations) to the amplitude of the anomaly produced. The anomaly amplitude is, in part, dependent upon the magnetic susceptibility of the ambient soils. Magnetic susceptibility is a measure of a substances' magnetic properties; large magnetic anomalies are generated from materials with a high susceptibility contrast. Soils with higher magnetic susceptibility provide a base capable of high intensity contrast to surrounding areas when enhanced by cultural activities. In areas of low magnetic noise, the magnitude of the contrast will be of less importance than in areas with considerable magnetic noise.

There are several ways in which cultural activity may produce a magnetic anomaly capable of detection in the ambient magnetic field:

Remanent magnetization - Heating activities, such as from domestic fires or pottery fires, produce changes in the surrounding soils by producing minerals with high magnetic susceptibilities (e.g., magnetite, maghemite, and hematite) which are magnetically oriented in the Earth's magnetic field. Due to the strong magnetic orientation of the material, these features will typically produce dipolar anomalies.

Anerobic decomposition - Areas with abundant humic material, such as midden areas or trash bins, will, in time, cause chemical changes to the magnetic structure by the percolation of water through the organic material to the earthen base. Typically these features will produce positive monopolar anomalies. However, chemical alteration can often result in magnetically oriented material, much the same as heating does; therefore, dipolar anomalies are also possible.

Depositional activity - Activities involving excavation of portions of the A and B soil horizons, such as pithouse construction, will produce a contrast to surrounding magnetism as, in time, the excavated area is filled by material with different magnetic susceptibility. Typically a monopolar anomaly results.

Compaction - Areas which have compacted soil matrices, such as roadways, plazas, or frequently traveled trails, will produce a magnetic contrast to the surrounding uncompacted areas.

Historical human activity - Areas which contain recent man-made materials, such as iron implements, live electrical wires, and barbed-wire fences, will often produce substantial changes to the magnetic environment. When conducting historical magnetometer surveys, this is desirable. However, during prehistoric magnetometer surveys, it is the source of additional noise which can cause problems in isolating culturally related anomalies. This type of anomaly is usually dipolar.

Anomaly Interpretation

Each anomaly has a "signature" characterizing its shape, size, amplitude, and form (monopolar or dipolar). The signature is distinctive for different objects; this often enables differentiation of various types of archaeological features. Much groundwork has been conducted in the past correlating magnetic anomalies to the actual cultural features recovered from archaeological investigations. Weymouth has done work in the Plains on Hadatsa villages (Weymouth 1976 and Weymouth and Nickel 1977) and in the Midwest on historic forts (Weymouth and Woods 1985). Huggins and Weymouth (1979) and Huggins (1984a) have conducted extensive studies on Anasazi puebloan villages in the Southwest. Huggins (1983, 1984b, and Huggins et al. 1984) has conducted correlations of anomalies with the northwest prehistoric remains as well as with the southern Caddoan cultural remains. Other work has been conducted in many areas of the world by von Frese (1985), Arnold (1974), Bevan (1975), Breiner and Coe (1972), and Lerici (1961). These studies are invaluable tools for comparative purposes when evaluating magnetic anomalies for cultural remains.

Several general guidelines may be employed when intuiting the source of a magnetic anomaly and establishing if the source is cultural. It is first important to understand the geophysical mechanisms which might cause particular anomaly "type," and second, to have a good knowledge of the cultural and geological histories of the area under study. With this combined information, plus use of previous studies in similar areas, models of anticipated anomaly signatures can be formulated for different feature types. When attempting to determine the characteristics of buried cultural features using their magnetic signatures, one must consider:

1. Anomaly polarization - anomalies with equal positive and negative intensity amplitudes usually indicate man-made objects; iron tools, barbed-wire, etc. Cultural sources producing dipolar anomalies generally have negative poles approximately 10% of the positive amplitude (Weymouth and Huggins 1985).

2. Dipole orientation - Culturally produced dipoles in the northern latitudes, such as kilns, will be oriented with the negative pole to the north of the positive pole. Non-northerly dipole orientation is usually an indication of recent trash or sources no longer retaining in situ magnetic orientation.

3. Amplitude - Culturally produced anomalies generally range from 1-100 gammas in contrast with the magnetic background. Cultural anomalies are predominantly positive but may be negative depending upon cultural and geological histories (Huggins 1983).

4. Anomaly shape - the shape of the anomaly will be reminiscent of the cultural feature shape. Distortion may occur, however, from other agents or complex stratigraphy. It is important to have survey intervals appropriate to the size of the cultural features anticipated.

5. Symmetry - because cultural features are mostly symmetrical, single-source anomalies resulting from them will tend to be symmetrical. Where burning is indicated, amplitudes may vary with depth of feature and homogeniety of firing across the feature.

6. Anomaly size - the size of the anomaly will be proportional to the size of the feature and the feature depth.

When determining the location of a cultural feature based on an associated magnetic anomaly, one must account for the inclination and declination of the local geomagnetic field. It is important to establish the displacement of anomalies from their cultural sources if very accurate location of features is necessary (e.g., locating features with small diameters-0.5 m). In the Southwest, Weymouth and Huggins (1985) found cultural features displaced to the north of the anomaly by approximately one-third the distance of the buried feature depth. Other considerations for identification and location of buried cultural features from their anomaly are survey accuracies, magnetic symmetries of the cultural features, and orientation of the survey grid to local magnetic declination.

MAGNETOMETER SURVEY TECHNIQUES

The total magnetic field over the Taliaferro site was measured by a proton precession magnetometer (Geometrics model G856). The apparatus consists of a sensor, which measures the magnetic field, and an instrument box, which records and stores the information retrieved. The magnetometers are capable of measurement to 0.1 gamma units, with an estimated survey accuracy of ± 0.25 gamma. Detailed description of the principles and mechanics of the proton precession magnetometer is available in Breiner (1973).

In order to reduce effects of diurnal variation, two magnetometers are employed in the differential mode. In the differential mode, one magnetometer is stationary and set up in an area of reasonably low gradient (25 gammas within a 16 square meter area) near the survey area. The stationary magnetometer is set to automatically record the magnetic field in regular time intervals (usually 4 to 8 seconds), storing every value and the time at which it is collected. In this mode, the G856 magnetometer is capable of storing 2,000 data points which results in 2 to 5 hours of measurement. The second magnetometer is synchronized with the stationary magnetometer and data is manually recorded and stored at regular intervals over the survey area. The data stored in this mode (moving mode) is the time, the measurement value, and the spatial coordinates. One thousand data points may be stored on the G856 in this mode. The difference between the two magnetometer values recorded at near-precise times (± 2 to 4 seconds) will provide the total magnetic variation over the survey area, less the diurnal drift during the time taken to collect the data.

Two people are needed for operation of the moving magnetometer. One person operates the instrument box while the second person holds the magnetometer sensor 2-4 meters from the instrument. The person holding the sensor must be magnetically "clean" to avoid unnecessary noise in the data measurements. The height of the sensor above the ground remains constant over an entire survey and is dependent upon the amount of magnetic noise in the vicinity. Typically, the height of the sensor is 0.5 m above the ground. The sensor is positioned along regular intervals over the survey area, and the data at each station is stored in the magnetometer. When the magnetometer has reached storage capacity, the information is dumped to a field computer and stored on tapes.

The survey areas are sectioned into 20 x 20 m units, referred to as "blocks," for ease in processing. One or more contiguous blocks on a site comprise a "grid"; several grids may be necessary to survey larger sites properly. The orientation of the two grids on the Taliaferro site was established parallel to magnetic north. The archaeological grid system used during the site excavation was employed on Grid 1. The coordinate system used on Grid 2 was a positive integer system with the origin in the southwest corner (0N, 0E) and values increasing to the north and east.

The spatial distance between the measured points will be dependent upon the desired resolution of the magnetometer survey. Sampling biases created by incomplete measurement over a feature tends to distort the magnetic picture of the resulting anomaly. Because complete measurement over a site is impractical, some interval level is established which will enable detection of the primary cultural features without excess time expenditure in the field. Determination of the appropriate sample interval involves consideration of the cultural feature size typical in the area of study. Typically 0.5 to 1.0 m intervals are used for location of archaeological features, but larger or smaller intervals may be desirable under certain conditions. For example, a survey anticipating hearths, which are typically of small dimensions, ca. 0.5 m diameter, may require a smaller survey interval than a survey for the location of structural remains. If the survey interval is set at 1.0 m, then only occasional hearth features will be sampled, and the sample will not be representative of the total magnetic field surrounding the feature. At a 0.25 m survey interval, however, several measurements will be collected from the feature area, and hence, provide a more complete picture of the magnetic anomaly caused by the feature.

Four 20 m ropes are employed to provide spatial control over each survey block. The ropes are marked in the appropriate survey intervals (e.g., 0.5 to 1.0 m). Two stationary ropes are used to mark intervals along the northern and southern block borders; the other two ropes extend north to south interval apart beginning at the western block border and are moved in intervals towards the eastern border until the completion of the block. The estimated positional error in regular, unvegetated terrain is ± 0.1 m for 1.0 m surveys and ± 0.05 m for 0.5 m surveys.

DATA PROCESSING AND MANIPULATION

The data collected in the field and stored on tapes are brought into the laboratory and transferred to a color processing computer, Terak Models 8510 and 8600. The information transferred is the difference between the stationary and the moving magnetometer data. This processing consists of reducing the moving and stationary data values by the total field (approximately 50,000 gammas) to obtain differenced values of equal positive and negative amplitudes. The result is a magnetic "background" of 0 gamma with higher and lower intensities balanced. Color density maps are then produced from this data set with shades of red representing higher magnetic intensities and shades of blue representing lower magnetic intensities. Shades of yellow and green are used to offset each intensity level. Pastel/whites indicate the background intensity. A total of 50 color intervals is possible with this system, enabling excellent resolution of magnetic intensity changes (e.g., magnetic anomalies). Maps are generated for entire grids, but where details are necessary, separate maps are generated in smaller units. The scale used will depend upon the range of intensity present in the data set. The intervals within the scale are evenly spaced, but one color may be used for more than one interval depending upon the desired level of interest.

Occasionally, surveys are conducted in areas of high gradients which can obscure the less-magnetic anomalies affiliated with cultural remains. Although it is best to avoid areas which may contain sources of "noise" (e.g., barbed-wire fences or electrical highwires), it is feasible to reduce the effects of such areas by one of several filtering routines. The technique typically used to reduce large regional gradients is convolution filtering. Convolution filtering involves averaging data values surrounding a central data point and replacing the central point by the averaged value weighted by a selected mathematical function. Convolution filtering generally results in the reduction of gradients with larger wavelengths so that the anomalies with smaller wavelengths (e.g., culturally related anomalies) may become visible. Color-density maps are generated for both the filtered and unfiltered data sets, when applicable.

Upon completion of the map generation and drafting, the screen is photographed and 8 x 10 color photographs produced. Black and white copies are provided in the final report for xerox replication.

RESULTS AND INTERPRETATION

The preliminary report provided at the completion of the survey and data processing includes a color-density map of each area surveyed along with an interpretation of the map describing the magnetic anomalies selected for archaeological investigation. The selection of anomalies with archaeological potential involves prioritization and classification of each anomaly depending upon its signature and confidence level of the anomaly having cultural affiliations. The following annotations are used in the report to indicate selected magnetic anomalies of possible cultural affiliation:

P Designates anomalies suggestive of pitstructure remains. Based primarily on size and intensity; dipolar anomalies result from burned structures.

S Designates possible structural sources of anomaly, such as rooms or storage facilities. Based on shape and size of anomaly.

F Designates anomalies possibly caused by cultural activities resulting in smaller features, such as firehearths.

M Designates anomalies which are interesting, but possibly a result of metal. Dipolar anomalies with northerly orientation or very strong monopoles may be considered due to similarity to other culturally produced anomalies.

I Designates anomalies of indeterminate sources, but of potential interest to archaeologists. May represent geological trends or unknown cultural affiliations.

1 - 5 The priority level employed to indicate higher (1) and lower (5) levels of confidence associated with the selection.

a - z Distinguishes anomalies of the same type within one survey grid.

Anomalies are annotated, then, by a three-part format. For example, P5a indicates the first possible pitstructure in a grid and is judged to be an unlikely candidate for archaeological sources. Additional descriptions of the selected anomalies include the center coordinates of the anomaly location in the grid, the amplitude, the polarity (or lack thereof), and a short verbal description of the anomaly and its possible cultural affiliations.

Previous Magnetometer Studies in Wyoming

To the author's knowledge, one other magnetometer survey has been conducted in Wyoming. Robert Huggins, of Spectrum Geophysics, was contracted by PIII Associates for magnetometer survey of sites threatened by construction activities for the Frontier Pipeline Project in southwest Wyoming. The geological conditions were very similar to the conditions found on the Taliaferro site. Magnetic contributions from the underlying desert pavement were probably responsible for the production of many of the selected anomalies on the six sites surveyed. However, Schroedl and Huggins (1985) report very limited success in identifying anomalies from cultural sources.

Magnetometer and Archaeological Synthesis: The Taliaferro Site

The Taliaferro site is located in a stable sand shadow environment with underlying desert pavement typical of the surrounding areas. The surficial evidence for the site consists of a large area of scattered fire-cracked rocks, tools, projectile points, flakes, and some groundstone. Smaller archaeological features were anticipated, such as campfires, ash pits, and possibly smaller storage pits.

Two blocks were established on the site (see Figure 1). Grid 1 was located within Excavation Area A from archaeological coordinates S3-S23 and E6-E26 (see Chapter 3; Figure 10). Grid 2 was located southeast of Grid 1 and was situated away from the major archaeological components identified on the site. Grid 2 was established as a control unit to allow comparison of magnetic anomalies resulting from nonarchaeological sources between the two grids, thus to enable better identification of archaeological anomalies on Grid 1. The terrain within both grids is gently sloping. Grid 1 was located across a small drainage, and several archaeological test trenches and units exist within the grid. Grid 2 was situated south of the same drainage but did not continue through the drainage center.

The magnetometer maps of the two grids are presented in Figures 2 and 3. The total magnetic variation is 60 gammas on Grid 1 (primarily from a piece of metal in one of the 1984 test units) and 30 gammas on Grid 2, well within an appropriate noise level for locating cultural anomalies. Comparison of the control grid (Grid 2) with Grid 1 on the archaeological site indicates some similarities. The sides along the drainage, from S3-S8 in Grid 1 and N12-N20 in Grid 2, are generally higher in intensity than either the center of the drainage (center of Grid 1) or the ridgetop (southern portion of Grid 2). Monopolar high intensity anomalies on Grid 2 resemble cultural anomalies but probably represent geological or pedological sources. These anomalies could be confused with archaeologically affiliated anomalies and are thus potential sources of misinterpretation. The 1984 test excavations on Grid 1 are magnetically visible as low monopoles.

The archaeological investigations conducted in April and May 1985 revealed 14 features within magnetometer Grid 1. The size of the features recovered were within the size range appropriate for the magnetometer survey interval employed on the site (0.5 m). Twelve features were of 1.0 m diameter or smaller. Three of these features (Features 29, 35, and 36) were likely associated with heating activities, although evidence of burning was marginal. Three other features (Features 28, 33, and 37) contained fire-cracked rock; however, no evidence of soil burning was noted (e.g., oxidation).

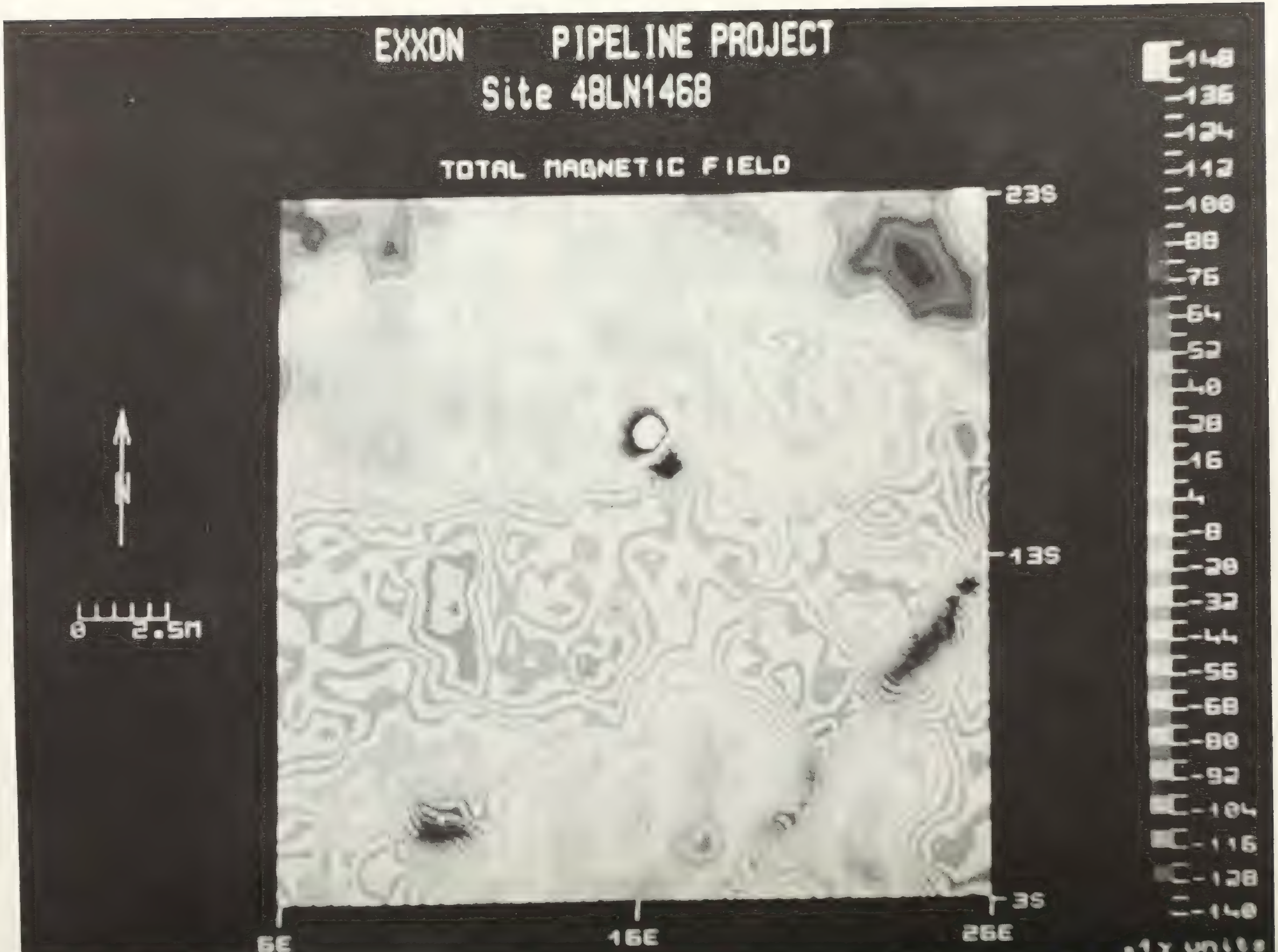

Figure 2. The total magnetic field over Grid 1, Taliaferro site.

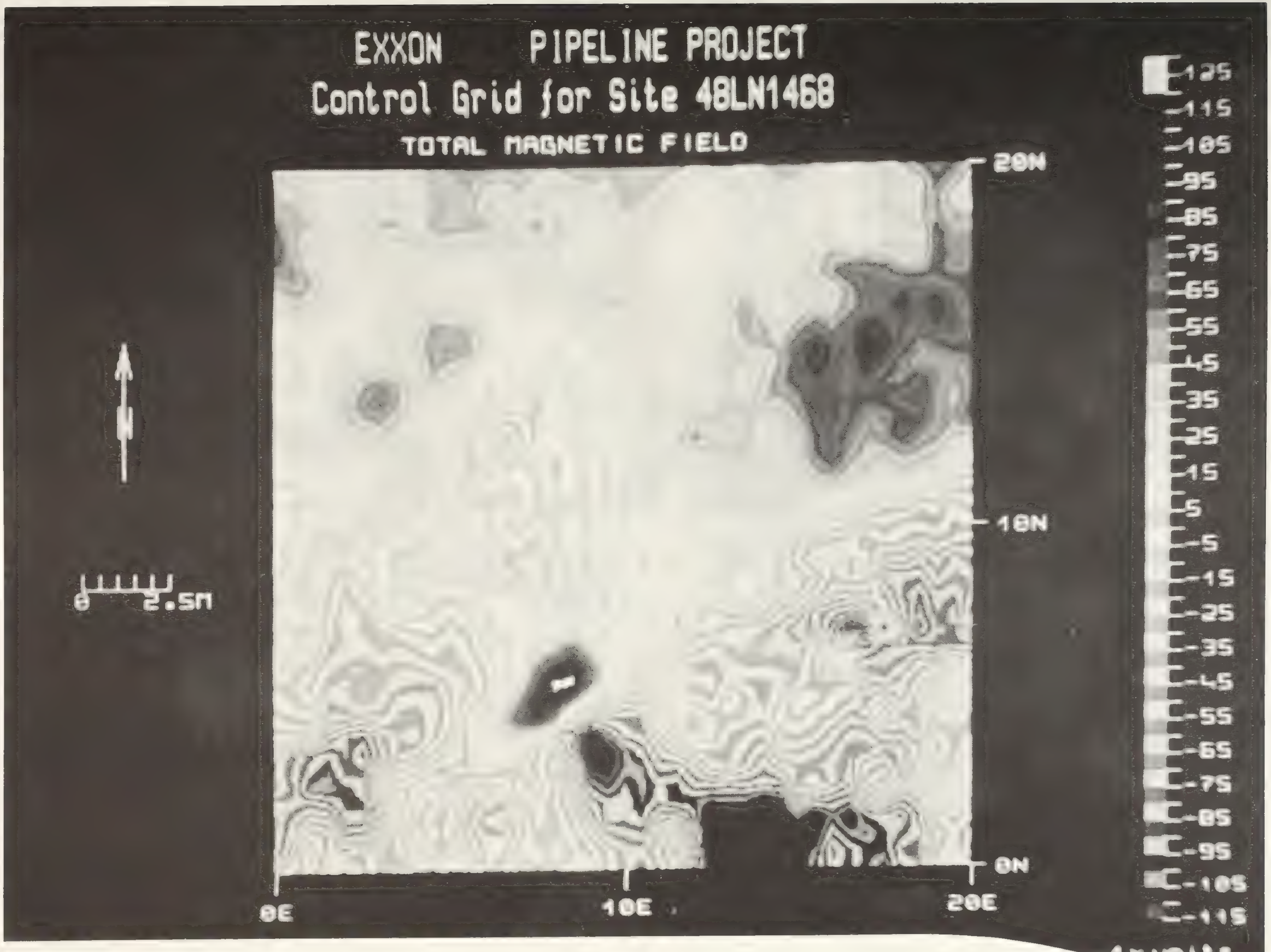

Figure 3. The total magnetic field over the control grid for Grid 2, Taliaferro site.

The remainder of the smaller features (Features 13, 19, 20, 21, 25, and 31) consisted of either small pits with dark fill or merely dark stained areas. One of the larger features consisted of a generalized area of ash with dark soil staining which measured approximately 6 m north to south by at least 8 m east to west (eastern perimeter not defined). The other larger feature, Feature 30, consisted of a basin with dark fill and measured 2 m in diameter. Only a portion of this feature was located within the magnetometer grid.

The results from the archaeological and magnetometer investigations are presented in Table 1. Anomaly annotations represent selected anomalies from preliminary analysis of the magnetometer data. One feature (Feature 13) is likely to be the source of a selected anomaly (F3b). The 0.6 m displacement to the northwest of the anomaly is probably a result of survey inaccuracies and anomaly displacement. The high intensity area surrounding a previous test trench (I2a) may be a result of the eastern portion of the midden identified to the west of this anomaly, although it is not clear why the anomaly does not continue to the full extent of the feature if this is the case. More likely, the high region is a result of backdirt piles from the A horizon removed and placed to the side of the test unit during previous excavations. A small portion of a high intensity region on the southern border of Grid 1 may denote the combined results of the northern portions of Features 30 and 35, however without complete magnetometer data, this cannot be properly evaluated. Re-evaluation of the magnetic map over the remaining feature locations (Features 19, 20, 21, 25, 28, 29, 31, 33, 35, 36, and 37) did not produce any indication of magnetic visibility of these features.

SUMMARY

The magnetometer survey of the Tailaferro site did not produce encouraging results for application of magnetics for the location of small cultural features in southwest Wyoming. Although no large noise-producing agents were present on the site, the anomalies produced from the geological substrata were similar to cultural anomalies anticipated, thereby causing confusion of geological anomalies with archaeological anomalies. Additionally, the cultural features did not reliably produce distinguishable magnetic anomalies. The lack of magnetic visibility of the cultural features at the Taliaferro site may be a result of one or two factors.

First, the activities conducted on this site may have been such that the replacement soils in the small pit features were of the same susceptibility as the surrounding soils (e.g., A horizon replaced the A horizon removed), thereby not producing any contrast in magnetism. Additionally, the features, which showed evidence of limited heating activities, were apparently not sufficiently hot to produce substantial magnetic alteration in the soils. The capability of small open firepits to produce magnetic contrast to surrounding soils has been shown by experiments conducted by the Archaeometric Laboratory at Colorado State University (Hathaway 1985). The lack of visibility of the oxidized features on the Taliaferro site may indicate very low-intensity heating activities or may represent dissipation of the magnetic contrast of smaller features (all three oxidized features were under 0.5 m in diameter) at depths greater than 0.5 m below ground surface.

Second, the lack of visibility of the cultural features may be a result of very low magnetic susceptibilities of the A horizon in comparison to the lower soil horizons and the geological formations. This may have created a

Table 1. Magnetometer anomaly correlations with the archaeological information, Taliaferro site.

Magnetometer Data					Arachaeological Data			
Anomaly Desig.	Center Coord.	Dimen. (meter)	Inten. (gamma)	Form	Feature Type	Excavation Unit	Dimen. (meter)	Depth from PGS (meter)
F3a	S 20.4 E 8.3	0.5 NS 0.5 EW	2.0	Monopole	Nothing identified/west edge of midden			
F3b	S 13.0 E 22.0	0.5 NS 0.5 EW	2.0	Monopole	Nothing identified			
F3c	S 15.0 E 23.0	0.5 NS 0.5 EW	2.0	Monopole	Not investigated			
F4a	S 8.5 E 22.0	1.0 NS 1.0 EW	4.0	Monopole	Nothing identified			
F4b	S 8.8 E 10.9	1.0 NS 1.0 EW	5.0	Monopole	F.13	S 9.2 E 11.5	0.6 NS 0.5 EW	0.2
I3a	S 20.5 E 16.0	5.0 NS 6.0 EW	5.0	General area of high int.	Possibly represents east portion of midden/backdirt from test excavation unit			
					Midden	S 13.0 E 19.0	6.0 NS 8.0 EW	0.3-0.8
-	No anomaly apparent				F.19 Pit Fea.	S 5.5 E 22.0	0.3 NS 0.4 EW	0.5
-	No anomaly apparent				F.20 Pit Fea.	S 12.5 E 15.0	0.8 NS 0.6 EW	0.2
-	No anomaly apparent				F.21 Pit Fea.	S 8.8 E 14.2	0.4 NS 0.4 EW	0.5
-	No anomaly apparent/mostly excavated in 1984 testings				F.28 Pit Fea./ FCR	S 17.5 E 15.5	0.5 NS 0.5 EW	0.9

Table 1. Concluded.

	Magnetometer Data				Archaeological Data			
Anomaly Desig.	Center Coord.	Dimen. (meter)	Inten. (gamma)	Form	Feature Type	Excavation Unit	Dimen. (meter)	Depth from PCS (meter)
-	No anomaly apparent				F.29 Burned sagebrush	S 21.0 E12.3	0.2 NS 0.2 EW	0.5
-	On edge of grid - possibly high intensity area at S0/E6				F.30 Basin	S 24.0 E 9.5	2.0 NS 1.8 EW	0.4
-	No anomaly apparent				F.31 Dk stain	S 22.0 E 9.3	0.5 NS 0.4 EW	0.4
-	No anomaly apparent				F.33 Stain	S 22.0 E 7.5	0.2 NS 0.2 EW	0.3
-	On edge of grid - possibly high intensity area at S0/E6, same as defined for F 30				F.35 Ox. stain	S 22.0 E 9.4	0.4 NS 0.4 EW	0.9
-	No anomaly apparent				F.36 Ox. stain	S 16.0 E 10.0	0.4 NS 0.2 EW	0.5
-	No anomaly apparent				F.37 Pit Fea. with FCR	S 16.2 E 10.3	0.5 NS 0.5 EW	0.6

situation which was not conducive to the production of magnetic anomalies by subtle cultural activities conducted within the upper soil horizons.

Although the results from this survey were not positive, it should be noted that different magnetic environments may enable location of smaller cultural features. The success of a survey cannot be fully anticipated without actually conducting a magnetometer program. Results from Schroedl and Huggins (1985) indicate partial success with locating cultural features in similar magnetic environments, although the desert pavement still presented some problems. Studies in northeastern Washington (Hathaway 1985) have produced very good results with using the magnetic record to locate small fired features, so that efforts to employ magnetometer programs to archaeological problems in southwest Wyoming should not be abandoned.

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